THE IRON TRADE REVIEW

VOLUME XXVIII. CLEVELAND, O. AUGUST 15, 1895. CHICAGO, ILL. NUMBER 33.

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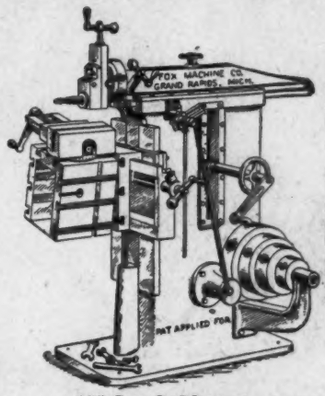

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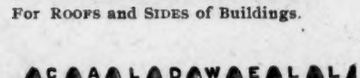

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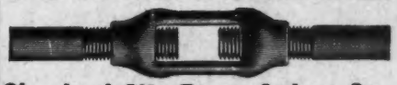

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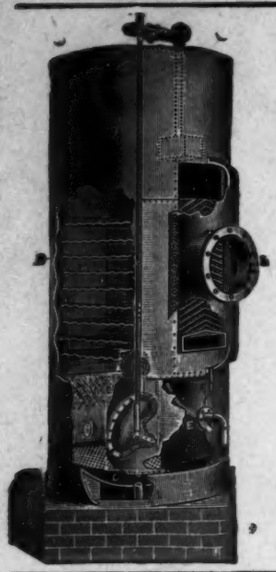

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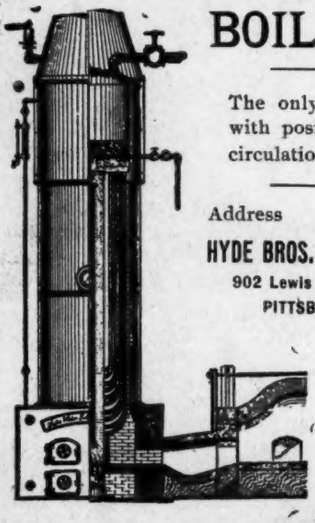

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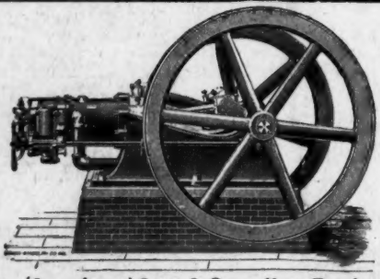

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THE IRON TRADE REVIEW

VOLUME XXVIII. CLEVELAND, O. AUGUST 15, 1895. CHICAGO, ILL. NUMBER 33.

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The strength of every department of the iron trade is being newly demonstrated with every week. In the face of the fact that buying has been at a lessened rate since mid July, there has been no weakening anywhere, and further advances have been scored here and there week by week. The reports of pig iron stocks, in spite of an increase of 12,000 tons a week in output Aug. 1 over July 1, continue to show a decrease. From 80,000 tons in May and 58,000 tons in June, the decrease was 45,000 tons in July, as shown by the reports of the Western Pig Iron Association. This, taken in connection with the absorption of the added production of the month shows how well behind consumption the furnaces are still keeping, and hence how little chance there is for any falling away this year from the present strong position. The probabilities now seem all to be on the side of a further advance. The government crop report is more of a factor in the situation than at any time since the advance began, and the support it has given recently to calculations of fall purchases by the railroads may be expected to start another upward movement in early fall. The sharp advance in barb wire decided upon at Chicago, Wednesday, is an index of the improved condition of the Western market for that product, and the further improvement that will come when the West and the Northwest have turned their large crops into money. No other advances by agreement are reported in the week, but it is quite well determined that wire nails will take another jump with the coming in of fall. Bessemer pig iron is in about the condition noted last week, with perhaps a firmer feeling, due to the belief that all the weak spot iron has been taken off the market. With no large buying, the market has been at $13.65 to $13.75 valley furnace, with no furnaces offering iron below $14, and some expecting to hold off until the market reaches $14.50. Inquiries have been made for Bessemer pig for the first quarter of 1896, and producers are maintaining a very firm front. In foundry iron the lull continues, but a renewal of buying is anticipated in the fall, many foundries that came into the market when the rise started, being content to cover for but a few months ahead. There is continued firmness in prices and in Southern and Western markets not a few sellers are declining to consider business at present. In the Central West several transactions in billets have been closed in the week, with some irregularity in prices. Wheeling district steel makers have generally held for $21, though one sale of 1,000 tons is reported at $20.75. Several thousand tons of Ohio River steel were sold in Philadelphia at $23.40. One sale of 500 tons of August steel is noted at $22.50 Cleveland. A valley mill has sold at $20.65 at mill. Plates are stronger. A sale of 2,500 tons for ship purposes was made at Chicago. There is no end to the demand for structural steel, Chicago offices alone figuring on 25,000 tons in the week.

THE CLEVELAND DISTRICT.

The strike in the Ishpeming-Negaunee districts is assuming more of the appearance of a long dead-lock. Officers of the miners' union have called on the mine managers in the week to learn on what terms the men can go to work, but the companies have refused to confer on the subject except with their own men. The strikers stoutly maintain that the struggle will be kept up indefinitely for recognition of the union, but this may be the outward confidence that precedes capitulation. The starting of steam shovels has been discussed by the companies, but this matter is entirely in the hands of the local superintendents. The freight market is strong at 90 cents for Ashland tonnage and 55 cents for Escanaba. Grain shipments are entering into the account now and boats are not plenty. Sales of non-Bessemer ores are reported for the week, including a supply for a Chicago furnace about to go into blast, latest advices being that foundry and mill irons will be made.

Pig Iron. A factor in the Bessemer pig iron situation to which little attention has been directed is the unsatisfactory working of a number of valley furnaces of late. Few were able to attain in July the large output of the preceding months, and for some reason not yet explained, the amount of off Bessemer was greater in July than for a long time previous. The effect of this condition will be in the direction of firmer prices. We hear of few sales for the past week, but those reported are at prices equivalent to $13.75 at valley furnaces, with the feeling general that the next buying movement will lift the price. Sellers of foundry iron report the week without sales of moment, though inquiries are being received indicating that many foundrymen will add to their supplies in September. Foundry business has shown a gradual improvement and the territory nearest to valley furnaces each month makes a decided increase in the amount of iron melted. Stocks of Lake Superior iron continue to diminish and are now at the lowest point since the beginning of the depression. Prices are quoted $13 to $13.50 at lake port, and a number of sales have been made at the former figure.

Finished Material. The market has been rather quiet, and sales have been limited, but there has been no weakening in prices. A few fairly good orders for structural material were closed, beams being still held at 1.68c to 1.73c, Cleveland. Angles are unchanged at 1.50c to 1.55c, Pittsburgh mill, ties at 1,60c to 1.65c, and plates at 1.80c and upwards. One sale of plates is reported at a figure a little under this. Bars have been in fair demand, and one or two inquiries have been received from implement makers. A number of sales of billets are noted, including one for 2,000 tons at $20.65, valley, one for 500 tons at $22.50, Cleveland, and one for 1,000 tons at $21.05, Cleveland. The range of prices is wide and is partly accounted for by the deliveries. A sale of 5,000 tons of rods is reported, at $28.50, Cleveland. Aside from this no transactions of any size were closed. An inquiry for 2,000 tons of rails has been received. Old material is quiet, and a feature of the situation is the scarcity of old steel rails, which are consequently very firmly held.

THE CHICAGO OUTLOOK.

[SPECIALLY REPORTED FOR THE IRON TRADE REVIEW.]

The most important news of the past week is that the Calumet furnace at South Chicago is undergoing the necessary repairs preparatory to going into blast. These are now well under way, and within ten days or two weeks this furnace will blow in, but whether on Bessemer or foundry iron is as yet undetermined by the new company, as much will depend on the situation then ruling. The market for pig iron has been quiet, no large orders being reported, but there was a very fair run of small lots of local coke and charcoal iron. Southern iron has sold in a moderate way up to several hundred tons, and as the rumors continue in regard to advances in freight rates Sept. 1, the inquiry for iron for shipment this month steadily grows. Prices on all grades are very firm and those on Bessemer have been stiffened. Finished iron and steel of all kinds is in fair to good demand, plates, bars and sheets being the most prominently active. While the effect of the government crop report has been more or less discounted, it is nevertheless a fact that it has had a stimulating influence on an already active market and despite the increasing output from furnace and mill there is quite a probability of further advances for raw iron as well as manufactured material, especially so now that the railroads are buying more freely.

PIG IRON.—Another furnace, the Calumet, will soon be active, but whether on Bessemer or foundry iron is an open question as yet. Its capacity is about 1,000 tons a week, which will relieve the situation to some extent. Local coke iron has been quiet during the week, sales light but the market firm and strong. Southern coke iron has been in fair demand. One agent reports closing an order for 1,000 tons, made up of various grades—principally No. 1 foundry at $13.25 to $13.50, and for prompt delivery. Inside prices are now a thing of the past. Several buyers are in the market for round lots and the naming of prices would be followed by their acceptance at once. This, however, furnaces at present are unwilling to do. Offers at slight cuts from regular quotations are not considered. Some furnaces are advising their agents in the North that they are not in a position to accept orders for any grades and decline to entertain business for any delivery. There is a good inquiry and the rumor of advances in Southern freight rates at an early date is quite a stimulus. Some 400 tons each Nos. 2 foundry and 2 soft for deliveries running to end of year are noted. Additional tonnage for 1896 was declined by furnace at current price. Lake Superior charcoal iron continues fairly active in small amounts, the largest order being one of 500 tons.

Lake Sup. Charcoal	$13 50@14 00	Southern No. 2 Soft	$12 25@12 50
Local Coke Fdy. No. 1	00 00@14 00	South'n Silveries No. 1	14 00@14 50
Local Coke Fdy. No. 2	00 00@13 50	South'n Silveries No. 2	13 50@14 00
Local Coke Fdy. No. 3	00 00@13 00	Jackson Co. Silveries	16 00@16 50
Local Scotch Fdy. No. 1	13 50@14 00	Ohio Silveries No. 1	15 00@15 50
Local Scotch Fdy. No. 2	13 00@13 50	Ohio Silveries No. 2	14 50@15 00
Local Scotch Fdy. No. 3	12 50@13 00	Ohio Strong Softeners	14 75@15 25
South'n Coke No. 2	12 50@12 75	Alabama Car Wheel	17 00@17 50
South'n Coke No. 3	12 25@12 50	Malleable Bessemer	14 50@15 00
Southern No. 1 Soft	12 50@12 75	Coke Bessemer	14 50@15 00

BARS.—Orders generally run to small lots from 50 to 100 or 200 tons, with one for 1,000 tons reported for a car company. Quite a good percentage of the business current just now is from railroads or for railroad purposes, and orders from this class of consumers are steadily increasing. Most mills are so well sold up that a consumer requiring bars, either iron or steel, for quick delivery would have to pay a premium to get them, and probably could not get what he wanted. Regular quotations are 1.40c@1.45c, common iron; guaranteed iron, 1.55c to 1.60c; soft steel bars from strictly billet stock, 1.55c to 1.65c.

BILLETS AND RODS.—Sales of billets have been light from local mills but prices are unchanged at $23@$23.50. Rods are in fair inquiry and quotations higher at $30@$31 according to specification. Sales of several hundred tons of blooms by a Pennsylvania mill for prompt delivery were made at $27 Chicago.

RAILS AND TRACK SUPPLIES.—No round lots are reported, but there has been a steady run of small orders up to 2,000 tons and there is a growing demand from railroads. Quotations are unchanged: Rails, $25 to $27; splice bars, 1.50c to 1.55c; trackbolts, 2.15c to 2.35c; spikes, 1.85c to 1.90c.

STRUCTURAL MATERIAL.—Demand is very active and during the week bids have been made on upwards of 25,000 tons of steel structurals, bridges and buildings, for Milwaukee, St. Louis, Rock Island, Ashtabula and Chicago. These, together with minor business and the heavy tonnage in sight on which bids have not been asked, will keep mills busy for some time. Warehouse trade is also fair at good prices. Quotations are made as follows: Beams and channels, 1.90c to 2c; angles, 1.85c to 1.90c; plates, 2c to 2.10c; tees, 2c to 2.10c. Small lots from stock are quoted ¼c to ½c higher.

PLATES.—Mill business continues excellent and some 2,500 tons of ship plates were placed by the Chicago Ship Building Co., for three vessels that firm has contracted for. Trade from store is quite good. Quotations are: Tank steel, 2c to 2.10c; flange steel, 2.25c to 2.35c; fire-box steel, 2.10c to 5c.; boiler tubes, 65 per cent discount.

MERCHANT STEEL.—Mill agents are exhibiting a much firmer tone as to prices on miscellaneous steels and some stiff advances are noted on some specialties of sheets. A very fair amount of new business is noted. Prices are as follows: Open-hearth spring, tire and machinery steel, 2.10c to 2.20c; smooth finished machinery steel, 1.85c to 1.90c; smooth finished tire, 1.80c to 1.85c; Bessemer bars, 1.55c to 1.60c; tool steel, 5.50c to 7.50c; specials, 11c and upwards.

SHEETS.—Most mills are now quoting 2.85c for No. 27 common iron, and don't want any business for early delivery. With some this would be so remote that they are practically out of the market. Galvanized sheets are in much the same condition, and on account of the "boom" in spelter discounts are very firm at 70 and 5 per cent off. Sheet steel is 1-10c higher than common iron, same gauge.

OLD RAILS AND WHEELS.—No transactions are reported in iron rails, which are unchanged at $15.50 to $16. Old steel rails are in fair demand at $11.50@$12. Car wheels quiet but steady at $11.50@$12.50.

SCRAP.—A leading dealer had a telephone inquiry from the largest consumer in Pittsburg for 2,000 tons of heavy melting steel. The deal will be closed this week. There is a moderate demand only for scrap in general, chiefly because holders are stiff in their views of the market. Railroad forge, $13 to $13.50; dealer's forge, $11 to $12.00; No. 1 mill, $8.50 to $9; heavy cast, $8.25 to $8 50; axles, $16 to $16.50; cast borings, $5.50; wrought turnings, $6.25 to $6.75; axle turnings, $7.50; mixed steel, $9; stove plates, $6; heavy melting steel, $10.50 to $11.50.

IN OTHER MARKETS.

[SPECIALLY REPORTED FOR THE IRON TRADE REVIEW.]

Cincinnati. A feature of the present market is a moderate booking of orders, and extraordinary shipments of iron already contracted for. To such an extent

is this true that the furnace companies find it impossible to keep the consumer satisfied, especially with the soft grades. It is the wise consumer these days that keeps a well filled iron yard, and many are finding out that it is better to anticipate their wants rather than be compelled to suspend work. The question of car supply may, in view of the heavy shippings and the large crops, cotton, corn and wheat, soon become a serious problem and is a factor that buyers should well consider. In coke irons the tonnage of new orders, while not unusually heavy, still averages up a good and fairly lively trade and the strength of the market is fully demonstrated by the almost total absence of cutting prices. Furnace men generally anticipate a big demand and somewhat higher prices when the summer months are over and buyers return from vacations. Charcoal irons are in fair demand at top prices. The furnaces that were cutting a few weeks ago, seem to have caught on to the fact that higher prices ruling of late have come to stay.

Buffalo. The pig iron business in this vicinity continues very much in the same line as for the past few weeks. The principal features are firmness and strength. There are no signs of weakness in the general situation from this point. Some foundries in this territory are not full of work by any means, but enough others are crowded with orders to such an extent that it more than offsets the dull times others are experiencing. One energetic concern is actually making castings in the open air, while waiting for the builder to make needed additions to the foundry. They report that if their foundry was equipped for night work, they would run night and day. A neighboring foundry reports that orders are very scarce and complains that they are not getting the volume of business they should at this time of the year. This is a fair example of what is found among melters of foundry irons in this territory. The malleable iron works and car wheel foundries are busy, and the car shops are watching closely for word regarding the expected large crops this fall. Inquiries are few, but shipments are very heavy. Some concerns show a disposition to stock up and to prepare for a large increase of business this fall.

Philadelphia Although actual sales of pig metal have been lighter this week than for several weeks past, there is evidences of good business later on, and more encouragement in sight than sixty days ago. Since the period mentioned, orders for 200 locomotives have been placed. The Illinois Central has just placed an order for 50 engines against a total purchase last year of 37. So far this year contracts have been let for 1,300 freight cars. The railroads after all hold the key to the situation and their attitude now is favorable to a permanent better condition of things all around.

FOLLOWING close on the successful operation by electricity of the Nantasket branch of the New York, New Haven & Hartford Railroad, near Boston, comes the announcement that work may shortly begin on the similar equipment of another branch of the some road, and that the Chicago & Northern Pacific Railroad has already begun to equip its suburban lines with electric power. In each case the trial is made to demonstrate the economy and feasibility of the plan and if it proves successful the number of steam roads near mines and towns which will be operated by electricity will be enormous. The foresight of the Westinghouse and Baldwin companies in making a working arrangement whereby the vast electrical experience of the one will be combined with the knowledge of practical locomotive construction obtained by years of experience of the other, must bring results which neither could expect in undertaking this line of work alone.—[Engineering and Mining Journal.

AMERICAN VS. ENGLISH STEEL WORKS.

At the meeting of the Institution of Mechanical Engineers, held in Glasgow on July 30, a paper was read on "Modern Steelworks Machinery," by James Riley, the following abstract of which, together with remarks made on the paper by Jeremiah Head, is taken from the *Colliery Guardian:*

Among the many results of the introduction of mild steel into engineering work might be mentioned the development of the various mechanical appliances used in the process of manufacture of that metal into the finished forms of sectional bars, plates, etc. As engineers had become better acquainted with its many excellent qualities, and had realized the possibilities opened up by its use, their demands on the manufacturers steadily increased for plates and bars of greater area, strength, and weight. Conversely, manufacturers stimulated these demands by costly outlay on improved machinery designed to deal with masses and weights which but a few years ago would have been looked upon as unattainable. This continuous emulation had resulted in the massive installations of machinery to be found in the most modern steelworks. The improvements or modifications which had been made of late in rolling mill engines had been in the direction of largely-increased strength and power and of careful attention to the designing of details. In these days of keen competition, when rigid economy was essential in order to reduce costs to a minimum, it was important that the consumption of steam should be reduced to the lowest possible point. In earlier days steel slabs were rolled from ingots under the hammer, but labor difficulties had led to the adoption of the cogging-mill, which was first used in 1884. A cogging-mill was designed in 1890 to meet some special requirements at the Blochairn Steelworks, and to embody some modifications suggested by the author's experience with the ordinary cogging-mill. Up to that time the widest slabs made in cogging-mills did not exceed 36 in. Slabs of much greater width were then required in special circumstances, and it was decided to adapt the mill to produce them up to 60 in. wide. Recently doubts had arisen whether steam-driven shears were the most suitable for the heaviest class of work, and consideration had been given to the use of hydraulic power for this purpose. It was a question worthy of consideration, however, whether plates of great thickness should be subjected to shearing. Shearing was detrimental to the edges of plates, especially when the shearing blades were in bad order; and the injury was greater with thick plates.

In the course of the discussion Mr. Jeremiah Head said he had recently returned from a tour in America to gain information on this subject. The principal point noticeable in America, as well as in this country, was the absolute necessity of all works of this character keeping themselves up to date. The works which twenty years ago were taking the lead, and were able to make a large sum of money, were now, if nothing had been done except keeping them in repair, entirely out of the running, and had no chance whatever of doing anything but lose money. In the manufacture of plates the almost universal practice in America was to roll them from flat ingots. The only exception he saw, in which the preliminary process of cogging was used, was at Carnegie's Homestead Works, though in other cases he found that exceptionally good work was being done by simply rolling from flat ingots. In this country this was a plan which was in use a good deal about fifteen to twenty years ago, but it was abandoned in the belief that Lloyd's Board of Trade tests could not be assured without the preliminary process of cogging, especially in very thick plates. Therefore cogging had become universal in this country. In America he was told that they were making plates in that way subject to the tests of Veritas—tests equivalent to Lloyd's—and they really had had no trouble.

THE first trip of the new steel canal boats of the Cleveland Steel Canal Boat Co. from Lorain, Ohio, to New York city, commenced on Saturday, Aug. 10. Six of the boats started, taking the first shipment of steel rails from the Johnson Co. to the Brooklyn, N. Y., Street Railway Co.

THE Riverside Tube Works, of Benwood, W. Va., has advanced wages 10 per cent.

THE IRON TRADE REVIEW

DEVOTED TO

IRON AND STEEL MANUFACTURE, FOUNDRY AND MACHINERY TRADES, IRON ORE PRODUCTION, TRANSPORTATION, AND GENERAL INDUSTRIAL PROGRESS.

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THE FUTURE WORK OF THE FOUNDRYMEN'S ASSOCIATIONS.

There has been considerable discussion at recent meetings of the Eastern and Western Foundrymen's Associations, and among foundrymen generally, as to the best plans to be followed to insure interest in the future proceedings of these organizations. The associations have grown rapidly in the past two years, and there appears to be some apprehension among the trade that they may become unwieldly and grow beyond control. There is no doubt whatever that if the right policy is adopted the associations will become even more valuable than they are at present, and may come in time to be ranked among the foremost technical associations of the country.

At the July meeting of the Western Foundrymen's Association a paper was presented by Mr. H. S. Vrooman, which caused an animated discussion then, and raised questions which will have to be settled some time, and the sooner the better. It is probable that some of them —the plan of securing a permanent home for the association, the division of the membership into classes and the idea of holding meetings at other cities than Chicago will be decided in the near future.

In the discussion on this paper it was brought out that the members are most interested in hearing papers on technical subjects, and questions of practical shop management. If the associations desire to become leaders of thought and of practice among foundrymen they will find it advisable, we think, to keep clear of any attempts to regulate prices or wages. These questions are purely local, and do not come within the province of technical associations. Cincinnati and Cleveland have associations whose province is to secure a uniform policy, each in its own city, on the question of foundry wages. The work of these associations begins and ends with that question, and there is never a discussion at any of the meetings of methods or practice.

It would be a hard matter to find a man who has attended any considerable number of the meetings of the Western Foundrymen's Association who would not say that he had been benefited by them and had learned much from the discussions. This is because, as a rule, the papers and discussions at the meetings have been upon practical subjects, and have given attendants the result of the experience of others in the melting of iron, management of the cupola, control of mixture, behavior of iron after leaving the cupola, methods of keeping shop costs, fuel economies, methods of testing that will insure uniformity in results, etc.

There are many other subjects of technical and practical interest that have not been touched upon so far, and on none of the questions that have been before the associations has the final word been said. Both associations have many members who are entirely competent to write practical and interesting papers on the different branches of foundry practice, and the question meetings which have been held have been found to be exceedingly valuable. The associations will accomplish the greatest good to the greatest number if they stick to the discussion of live questions of shop management and more economical and more scientific production. If they attempt to cover the field of wages, prices or credits, the chances are they will fail, or at best contract into merely local societies.

Already a difference is noticeable between the Eastern and Western associations. The former has devoted a good deal of time to the question of prices,—not to any attempt to fix prices, perhaps, but to an agitation for better prices and to some extent the tariff and finances have been discussed. The membership has been drawn largely from the heads of concerns, who are not apt to be so much interested in the details of everyday shop work as in administrative and market questions. On the other hand, the large majority of the meetings of the Western association have been devoted to discussions in which the foundry foreman or superintendent is interested, and the attendance has been drawn largely from their ranks. With the discussions participated in by men thoroughly up to date on actual foundry practice, it has resulted that the proceedings of the Western association have had a wide reading among foundrymen, and have excited considerable attention in foreign countries. Several of the papers read before the Western Foundrymen's Association, with abstracts of the discussions, have appeared in English periodicals.

Perhaps the subject of physical and chemical tests of cast iron received an undue amount of attention from both associations last year and the latter part of the preceding year, but it is to be said on the other hand, that in no other way, than by repeated discussions, and by putting competitive interests on their mettle, and by argument and counter-argument, between special champions of physical and of chemical analyses, could the foundry world have been stirred out of the rut into which it had fallen. We believe that the apprenticeship system, while an administrative, rather than a technical question, is one which the foundrymen's associations, as was suggested at the Philadelphia meeting last week, can take up profitably. Stove foundrymen are suffering from a lack of good molders. The same can be said of other departments of the business. There is no provision, as things are to-day, for counteracting the evil tendency which the over-exactions of unionism have emphasized more and more strongly. Two years of quiet business have obscured the trouble, but more will be heard of it as business becomes active again. The question is one of general application, it is exceedingly difficult of solution, and the foundrymen's associations will find it worthy of their best thinking.

We believe the lines for future work pointed out in the paper read at Chicago in July, are those on which the largest good can be accomplished, and we are glad to know that those who have been most active in the educational work of the past two years are least likely to be diverted from a policy that has given these organizations prestige both at home and abroad.

A LOOK AHEAD IN IRON.

The prediction of Hon. Abram S. Hewitt, made in 1856, that in 1875 the world's production of pig iron would be 14,000,000 tons, was within a few thousand tons, it will be remembered of the actual output of the iron-producing countries in that year. At the beginning of the present decade, Mr. Hewitt predicted that the United States would produce in 1900 a total of 15,750,000 tons of pig iron, and that in the same year the world's production would be 35,000,000 tons. A more extravagant prophecy was made also in 1890, by Mr. Edward Atkinson; this he reviews, with some changes suggested by the depression of the past two years, in an article entitled "The Signs of the Times," contributed to the *Engineering Magazine* for August. Without going at length into the argument of the writer, which, like that of Mr. Hewitt in 1856, is based upon the proposition that the consumption of iron is a social barometer by which to estimate the relative height of civilization among nations, we give first his summary of consumption of iron in round figures, for 1889:

	Population.	Per Capita.	Tons.
United States	64,000,000	300 lbs.	8,500,000
Great Britian, France, Germany and Belgium	136,000,000	175 "	10,500,000
All the rest	1,200,000,000	11 "	6,000,000
Total	1,400,000,000	40 lbs.	25,000,000

Basing his forecast of 1890 on this analysis, Mr. Atkinson figured that the consumption of iron would go on increasing, subject to temporary variations, in the decade whose middle point has been already passed not only in the existing ratio to the population, but in an accumulative measure corresponding to the increase per capita—from 150 to 300 lbs.—developed between 1877 and 1889. But assuming that this increase per capita should rise, not from 300 to 600, but to 400 lbs., then the 80,000,000 people who would occupy the country in 1900 would require 7,000,000 gross tons in addition to the 8,500,000 tons consumption in 1890. Figuring for Great Britain, France, Germany and Belgium, an increase of but 20 per cent in the same ten years, their requirements would be 2,000,000 tons additional in 1900. For the rest of Europe, Asia, Africa, South and Central America and Australia, the increase per capita was reckoned as 100 per cent or from 11 or 12 lbs. to 22 or 24 lbs. This would mean 6,000,000 tons additional to their 1890 consumption of 6,000,000 tons. Summarizing these estimates, the forecast for 1900 was made thus:

Production in 1890 based on the figures of 1889	25,000,000 tons.
Increased consumption in the United States	7,000,000
Increased consumption in Great Britain, France, Germany and Belgium	2,000,000
Increased consumption in all the rest of the world,	6,000,000
Total increase of demand	15,000,000 tons.
Total supply required in the year 1900	40,000,000 tons.

Mr. Atkinson refers to the halt called upon constructive enterprises by the panic of 1893 "due to the attack upon the credit of the country and the threatened debasement of the unit of value," as responsible for the disturbance of his calculations of an accelerating demand in all the years of the last decade. The domestic consumption of iron which in the past two years has been less than the 300 lbs. per capita with which the decade was entered upon. Mr. Atkinson believes it to be now at the rate of 350 lbs. per head, citing the authority of Manager Swank of the American Iron and Steel Association for the statement. He adds:

The population at the present time is, in round figures, 70,000,000. At 350 lbs. per head the requirements for the next 12 months would be within a fraction of 11,000,000 gross tons,—a little over 12,000,000 net tons. One-eighth of our consumption, however, is derived from old scrap iron and steel, old rails, car-wheels, etc. This will reduce the demand upon iron furnaces to about 9,500,000 gross tons, or a little over 300 lbs. per head of new iron.

Prominence is given in Mr. Atkinson's forecast to the railroad demand. Contrary to what has been said on this subject from the standpoint of investors, he believes there will be an early expansion of track laying to something like the average of the past 15 years. He thinks this average—about 6,000 miles a year—may be renewed in 1896, and that not less than 100,000 miles of new railroad must be constructed in the next 15 or 20 years. He takes the position that capital has been excluded from states like Texas because of the discredit brought on them by their representatives in Congress voting to lower the unit of value. When these misrepresentatives of the people are ejected from Congress he looks to see the railroad service of such states developed to the proportion required by their great resources. If Texas, for example, had railroads in the same proportion to area and resources as Ohio, Indiana, Illinois, Iowa and Kansas, she would have 40,000 miles of track instead of 10,000.

Along with the renewal of railroad buying, Mr. Atkinson looks for a large demand for iron and steel for vessel building, repeating in this connection his well known views on the relation of our tariff and navigation laws to the development of a ship-building industry.

He calls attention, also, to the largely increased call for steel for buildings and many other kinds of work in which wood and other material have been used.

It will be noticed that Mr. Atkinson's prediction of a consumption of 15,500,000 tons of iron in the United States in 1900 is very close to Mr. Hewitt's 15,750,000 ton estimate of production in that year. Both were based on a continuance, in a cumulative ratio, of such a demand as was seen in the latter part of the last decade. That condition of things has been rudely disturbed. To-day, with the demand for iron greatly enlarged over that of 1894 or 1893, because the postponed wants of nearly 70,000,000 people are being filled, the temptation to indulge in optimism is strong. But we believe few will be found in the iron trade willing to give practical evidence of their faith in Mr. Atkinson's forecast by putting money into the additional furnaces and mills and steel works, which would be demanded by the attractive programme he has laid out for us.

THE meeting of the representatives of steel companies referred to in our last issue was held at Atlantic City, Aug. 9. There were representatives present from nearly all the makers of plates and structural shapes in the country, and the proposed standard specifications for steel on the lines indicated in these columns were discussed. The new specifications have not been promulgated as yet, but it is believed the changes already outlined have been adopted.

JOHN R. IRWIN, manager of the iron ore and coal docks at Fairport, O., died on Aug. 13, of apoplexy. Mr. Irwin was superintendent of the P. & Y. R. R., in 1886, and afterwards was made superintendent of the P. P. & F. R. R., which latter position he resigned to assume the management of the terminal companies at Fairport. He was well known among vessel and ore men, and commanded their respect and esteem.

CONTRACTS have just been closed for the shipment to Philadelphia and Baltimore of 60,000 tons of iron ore from the mines of the Spanish-American Iron Co., in Cuba. These contracts follow one announced recently, by which 35,000 tons of iron ore were to be brought from the same mines in Cuba, five cargoes having already arrived, with over 20,000 tons.

THE FOUNDRY YARD.

BY A. SORGE, JR.

The beginning and frequently the end of castings is to be found in the foundry yard. There are stored the raw materials in the way of iron from which the mixtures are made that are melted in the cupola, and here also are thrown the so-called bad castings and scrap. Slabs to be used for lighting the fire in the cupola, for drying out the linings and heating up ladles, and for skin-drying molds, are generally kept in the yard. Occasionally we also find sand stored there. The flux used in the cupola is usually kept here; also such flasks as are not in very frequent use, and lumber for repairing and making new wooden flasks. The coke and coal employed as fuel are unloaded here ready for use—in fact the bulky materials that enter into the daily work of the foundryman are usually kept on hand in the foundry yard. In some cases we find all these articles properly stored and protected, but unfortunately this is not the rule.

The breaker for reducing the size of heavy pieces of scrap and wheels is usually set up in the yard and is surrounded by the material already broken and yet to be operated upon.

Attention has been frequently called to the value of keeping the foundry yard in good order, but unfortunately it is difficult to impress this with sufficient force upon the minds of most foundrymen. The disorder so frequently apparent is generally caused by leaving the care and arrangement of the yard to some employee who has no thorough realization of the economy and value of order. Still the subject is sufficiently important to warrant its being considered somewhat in detail.

Pig iron should be carefully stacked up, care being taken to have good drainage away from the stacks, which should not be much more than six feet high, so as to permit of the upper pigs being easily reached. It is generally advisable to stack each carload or shipment together and label it. A good way is to label the stack with the car number. If this is done systematically and the various stacks of the same iron are used up in succession and not all at once, then it becomes very easy to determine at any time the exact amount of iron on hand, and by comparing this with the amount purchased, from which has been deducted the amount reported used by the cupola tender, it is possible to check the latter closely. Another important advantage gained by this method of labeling and separating the various shipments of iron is that the cupola-tender is prevented from using his discretion in making up mixtures. This is a more serious matter than is generally realized, and cases of unexpected results from apparently well known mixtures may frequently be traced to the cupola-tender's firm belief in his own judgment of iron or else his conviction that any two kinds of the same grade of iron are interchangeable. However, when the knowledge of kind or grade of iron in each stack is carefully concealed, so that only the foreman or whoever has actual charge of directing the mixture shall know what they are, it will be found that erratic results become less frequent and disappear entirely if the latter is thoroughly competent. When this method of labeling is employed the cupola-tender receives daily a ticket stating merely the amounts, as follows: 500 lbs. No. 10,433; 1,500 lbs. No. 672; 1,000 lbs. No. 68,217; 1,000 lbs. No. 24,111, etc. After this method has been followed for a while the cupola-tender loses track of the grades and kinds of iron, and having no tangible guide to help him, he fears to make substitutions.

In stacking pig iron it is usually most advantageous to make each stack as wide as the length of one pig, and place two stacks close together, with an aisle about 20 inches wide between them. Also set the stacks about 30 inches back from the track or road on which the charging cars or barrows are run, and at right angles to this track. The stacks should be so located that they are handy to the cupola, and so that cars can be unloaded without carrying the pigs a great distance.

The scrap piles should be so arranged that the different grades of scrap are kept separate. In other words, light work and heavy castings, which usually vary considerably in character, should be kept apart. Also if a special lot of scrap of known composition has been obtained it should not be thrown into a general heap with all others. Salvage of various kinds from the castings made should be either kept in separate graded heaps, or should be thrown into the various heaps of scrap of similar character. These scrap and salvage heaps should be located with a view to the same handiness to cupola and place of unloading as the stacks of pig iron. The breaker should be placed near the scrap piles so as to avoid the labor of long-distance handling. When a drop is used as a breaker a good foundation should be built under the iron bed on which the breaking is done, so as to prevent the latter from being driven into the ground and causing added labor in handling the material as well as loss of the bed.

When turnings, borings or punchings are used in making the mixtures, it is best to keep them in a sheltered place so as to avoid their rapid oxidation.

In all cases the scales for weighing the various materials used in the meltings should be nearer the cupola than the materials, so as to avoid unnecessary carrying.

Old churn-rods and core-rods should be straightened when of sufficient length to be used again and should then be returned to the store-room. Those that are too short for further use, also the ends of churn rods holding the cast iron attached during feeding, should be piled together near the turnings and punchings, as they are very useful material in certain mixtures. All bolts, nuts and washers should be returned to the store room, where the man in charge should sort and clean up those that can still be used and send the useless ones to the pile of rod-ends. Even where the yard room is small it is always possible to separate the different kinds of scrap and pig iron in a general way, and the result will be that the foundryman finds after a short time that the means at his command for varying the quality of his castings are largely increased in number, and the certainty with which results once obtained can be reproduced will more than repay him for the slight extra trouble taken.

The questions involved in the most economical method of handling the materials do not enter into the scope of this article, as local conditions and the magnitude of the plant are largely involved and have a decided bearing on the subject.

The fuel used in the cupola should always be stored under shelter so as to avoid its getting wet and freezing in winter. This question of moisture in the fuel is one to which not enough attention is paid by the average foundryman. Coke particularly is a porous material and will hold large amounts of water. This water not only increases the apparent weight of the coke charged, thereby actually lessening the amount of usefully available combustible, but it must be evaporated and the vapor of steam raised to the temperature of the contents of the cupola, thus abstracting another large amount of heat from its legitimate purpose. The effect of water contained in coke is frequently to slack or pulverize the latter when it is charged. The rapid evaporation of the water produces steam of a sufficiently high tension to burst the piece of coke in which it is contained, thereby destroying its ability to carry the load above it and choking the cupola; which result is liable to necessitate much labor and expense in cutting out linings and replacing them, besides preventing the completion of the melting. Other serious results are liable to happen from this cause, but one result is sure in all such cases; namely, uncertainty and irregularity in the melted iron, which may be hot or cold, liquid or sluggish, clean or dirty with apparently the same charges of material and fuel of the same kinds at different times. It is advisable to have several bins for storing coke, so as to separate different shipments whose character may involve different amounts of charges and different manipulation of the cupola.

The flux, usually limestone, used for removing the impurities of the iron is preferably stored under shelter, although the effect of exposure is not as serious as with coke unless continued for a long time with alternate frost and thaw. The amount of fluxing material is small compared to the amounts of iron and fuel used and its care is therefore a matter of no very great difficulty.

Sand should never be stored outdoors. Rain will not only reduce the sandpile considerably by washing it away, but it removes portions of the binding material which give the sand its character. Frost is one of the worst enemies of molding sand and when the latter is kept outdoors it will surely be attacked thereby.

All lumber, whether in the form of slabs and kindling or in shape of boards, planks or dimension material, should be kept in a room which is well ventilated and protected from exposure to the weather. The value of the slabs and kindling

is greatly reduced as heat producers when wet, besides evolving quantities of heavy smoke which are annoying and interfere with the work in the foundry.

The dimension lumber, such as boards, planks, etc., which is kept on hand for making repairs to old flasks and for building new ones, should be thoroughly dried and free from shakes, splits, etc. Exposure to alternate wetting and drying is very liable to produce these defects, although they can be avoided by proper piling and covering. Still it is advisable to dry this lumber in a room properly warmed and ventilated, even after it has been thoroughly air-dried. A large saving in repairs of flasks can be made by proper attention to the quality and care of this lumber. A good place to store such lumber is on hanging shelves under the ceiling of the wooden flask room. Space is economized by this means, the material is ready at the hand of the carpenter, and is kept dry.

The materials so far discussed are of such daily use to the foundryman, that provision is always made for their care, even though such provision may not be in accordance with the greatest degree of economy and usefulness. But the care of the gradually accummulating mass of flasks is only rarely considered with sufficient minuteness to induce a systematic method from the start. Although yard room is provided for flasks, it is generally found that they are stored without due regard to easy access and handling. The proper method is to store them under shelter also; but this involves such large sheds or store-rooms in many cases that the first cost of same is prohibitory and they are kept in the yard. If they are carefully piled up there and all component parts are kept together, much destruction as well as labor in handling will be avoided. Each flask should be plainly marked with a number, the same number appearing on all loose parts belonging to it. This number, together with a short description giving dimensions and the character of work that it is adapted to, also indicating clearly its location in the yard, should be catalogued. Care should be taken always to return the flask after use to its proper place, or if the location has been changed, then this should be noted in the catalogue. Much time will be saved by using such a system. Iron flasks and wooden ones should be kept separate so as to avoid confusion and destruction of the latter. Flasks that have been injured should be repaired before storing, as valuable time is frequently lost on hurried work when the services of the carpenter and blacksmith are first required to put them into shape before they can be used. Such as are injured beyond reasonable repair should be broken up at once so as to avoid the danger incident to their use. Good drainage away from the storage place of flasks is a vital necessity to their preservation.

The core-arbors used in the foundry may be safely stored outdoors if the general rules applicable to the care of flasks be followed in their case. They should, of course, be kept near the core-room.

A convenient system of tracks in the foundry-yard leading from the various storage places into the parts of the foundry where the respective materials are to be used, is a great saver of time and expense and should be introduced wherever practicable.

In general it may be laid down as a rule that it is best to shelter all materials used in the foundry and to separate carefully the different grades and qualities; but even when such shelter can not be obtained, the proper and systematic arrangement and care of these materials should in all cases be one of the principal duties of the foundryman.

THE foundry of Knowles' Steam Pump Works, Warren, Mass., and a large wooden pattern house were burned last week. The contents of the pattern house alone were valued at $85,000. Total loss, $175,000, fully insured.

A NUMBER of puddlers in the employ of the Oliver Iron & Steel Co., at Pittsburg, went on strike last week on account of a refusal of the firm to sign the Amalgamated Association scale.

THE Wilkes Rolling Mill, Sharon, Pa., will probably resume soon. A new engine and fly wheel are being placed in position, and other repairs are being made. The mill manufactures muck bar and employs about 200 hands.

FOUNDRYMEN'S ASSOCIATION.

The fiftieth monthly meeting of the Foundrymen's Association was held at the Manufacturer's Club, Philadelphia, on Wednesday evening, August 7. Owing to the excessive heat the attendance was very light, there being less than a score of the members present, when President Schumann called the meeting to order.

The reading of the minutes of the last meeting was dispensed with, and Secretary Evans then read the report of the Executive Committee, which was as follows:

"This is the fiftieth meeting of this association, the only break being the July recess, which is only one meeting lost during the past four years. Your committee is well pleased with the progress this association has made, and we think that as business improves, our association will increase in numbers as well as the interest taken by the members.

"It is now proposed to hold a National Association of Foundrymen under the auspices of this association in this, the Manufacturer's Club. There are a number of questions that should be talked over that are of interest to every foundryman. We do not think it would be advisable to make a price at which castings should be sold, nor the price of labor. The position and facilities are so varied that it would be impossible to come together and make a rule establishing the price of castings, or the wages paid that would be acceptable to all. Therefore, if this association should attempt to interfere, we feel quite confident we would lose the power for educational purposes that we are now holding, as such interference would undoubtedly end in a strike.

"We believe the questions of the hour should be talked over and discussed, the idea being to post the foundrymen upon new and interesting subjects that they may better know how to conduct their own shops.

"Another question that may be agitated is the apprenticeship that was so common years ago. There is really a scarcity of molders—that is, good molders—in this vicinity, and it is time to make new ones as quickly as possible that shops may keep up to the times. We propose to go on as we have been doing, by procuring papers upon different subjects, hoping it might be acceptable to the members and others who take the time to come to our meetings. The foundry business is in better shape than it has been for two years. It is rather spasmodic; that is, busy one month, while the next may bring a reduction in the output. We have heard where prices of castings have advanced from one quarter to a half cent per pound, which is more than enough to cover the extra cost of fuel, labor, etc., and we think if the foundrymen would be a little more independent and not so eager to fill the shop at low prices they would gradually receive better figures."

After the reading of this report, expressions of opinion as to the plans for the proposed National Association were called for. Messrs. Faber and Wood thought that in inviting foundrymen to attend, the Philadelphia Association should announce some topic of general interest to be discussed, that those invited might know beforehand how important the proposed convention was destined to be. Mr. Faber thought the apprenticeship question was a very important one, and Mr. Wood after urging the preparation of an attractive programme moved that a committee of five be appointed by the president to formulate ways and means. It was afterward suggested that the president and secretary be included as ex officio members of the committee. The following committee was then appointed: Messrs. Walter Wood, Thomas Devlin, Thomas Glover, J. Sellers Bancroft, and W. H. Pfahler. The committee was requested to meet for organization the following day. Secretary Evans then read extracts from a paper read by Mr. Vrooman before the Western Foundrymen's Association at its last meeting, and after further discussion of minor importance the meeting adjourned.

THREE hundred laborers at the New Castle, Pa., tin plate mill struck last Monday. They are getting $1.25, and want $1.35 per day.

AT Ashtabula, O., last Sunday, four hoisting machines on the ore docks were blown down in a high wind storm, causing a loss of $10,000.

LAKE SUPERIOR IRON MINES.

The claim of Robert and Annie Crowley, two residents of Nova Scotia, to 160 acres of land on the Mesabi range, including the Auburn mine, has been decided by the court at Duluth adversely to the claimants in every particular. The Auburn cost the present leaseholders, the Chicago & Minnesota Ore Co., over $500,000, and it is easily worth $1,000,000 now.

At the Biwabik four steam shovels and 12 small locomotives as well as a large number of dump cars, are at work on the new stripping contract let at this mine last week. The work will be rushed rapidly. About 300,000 yds. are to be stripped before spring.

Shaft B of the Canton has been shut down this week owing to the scarcity of men. But 79 men went underground Monday morning and there should be nearly 300.—[Mesabi Range.

July shipments from the Lone Jack (Oliver property), were 100,000 tons.

The report from the Mesabi range of a round sale of Franklin ore at $3.35, is 10 cents above the actual. Yet $3.25 is well beyond the limit of any predictions for the best of Mesabi Bessemer that would have been made early in the present season.

Application has been made at Duluth for the appointment of a receiver for the Standard Ore Co. The company recently assigned its leases of the Cincinnati and Hale mines to the Minnesota Ore Co., a new corporation. It is claimed that this was done to give a preference to the Minnesota Ore Co. and the court is petitioned to set it aside. The company was harrassed by small suits and could not raise the money to carry on the business. We are informed by officers of the Standard Ore Co. that no preferences have been given, and that it is intended to pay the debts of the company in full.

The Penn Iron Mining Co. has announced an increase of 10 to 25 per cent in wages at its mines at Norway, Mich. A similar advance has been made by the Aragon Mining Co.

At the Chandler mine, new No. 4 shaft is down 120 ft. It is sunk because the ore body was found to be cutting under the old shaft and the caving would soon wreck it. The company is shipping about 4,000 tons a day and is getting rid of its stock piles as fast as a steam shovel, working day and night can load them. About 150,000 tons are yet in stock.

Some advances in wages have been made by the mining companies on the Mesabi range. The Franklin has raised wages 20 per cent and the Oliver is paying common laborers $1.50 instead of $1.35. At the Lake Superior mine at Hibbing an advance was made from $1.35 to $1.50. The Minnesota Iron Co. has also made advances at its Mesabi mines.

Stockholders of the Metropolitan Land & Iron Co., owning the Norrie and other mines, have received a dividend of $1.25 a share.

It is reported that the suit of William McKinley, John McKinley and James Charnely, of Duluth, against the Lake Superior Consolidated Iron Mines, has been settled. The plaintiffs asked for $620,000, claiming that they had been defrauded in the negotiations by which properties in which they were interested were acquired by the Consolidated. On trial, the jury disagreed. It is reported that the figure on which the compromise was arranged was in the neighborhood of $190,000.

Three Great Canals Opened in 1895.

It is a rather curious coincidence, says the Boston *Advertiser*, that three of the most important canals which have been finished during the present decade have been opened just at this time. These canals are the Sault Ste. Marie Canal, which is one of the most important shipways of its kind in Canada; the Harlem Canal, connecting the Hudson river at New York with Long Island Sound; and the Kiel Canal, connecting the North Sea with the Baltic Sea. These three canals are essentially diverse in construction and location, but all three are important feats of engineering and are more or less important in a commercial sense.

The completion of the Sault Ste. Marie (Ontario) Ship Canal gives the Canadian commerce a continuous waterway nearly 2,500 miles long from the head of Lake Superior out into the Atlantic Ocean, so that it is at last possible to sail from the province of Ontario to Australia without entering any body of water controlled by a foreign power. The lock, which is one of the chief features of the Canadian Ship Canal, is next to the largest in the world, its superior being found only in the big lock which is being constructed across the rapids on the American side.

It is said that the cost of the canal and lock is about $4,000,000, a rather large expenditure of money in consideration of the fact that there is little, if any, need of this canal. The construction of the American canal in itself offered one very good argument why the "Soo" need not have been built. The claim might have been made that it was proper to provide some accommodation for Canadian commerce, were it not for the fact that this commerce only equals 3½ per cent of the amount carried through the "St. Mary's Falls" Ship Canal.

United States Coal Production in 1894.

A paper by E. W. Parker, prepared for the forthcoming volume of the "Mineral Resources of the United States," gives the statistics of coal production in this country in 1894. The total production of coal of all kinds in that year was 152,447,791 gross tons, equivalent to 170,741,526 net tons, having an aggregate value at the mines of $186,141,564. Included in this product is the coal shipped, the amount sold to local trade and used by employes, and the amount consumed at the mines by private locomotives or in furnishing power for ventilation, haulage, etc. It also includes the amount made into coke. The total marketable product was 146,816,277 gross tons, or 164,434,230 net tons. This includes all the product except that used by the operators themselves and known technically as "colliery consumption."

Compared with 1893, the production of coal in 1894, in both the anthracite and the bituminous fields, shows a marked decrease. In 1893, the total product was 162,814,977 gross tons, or 182,352,774 net tons, showing a decrease in 1894 of 10,367,186 gross tons, or 11,611,248 net tons, or a little more than six per cent. The total value shows a decrease of $22,297,132, or more than 10 per cent. The average price per net ton received for all kinds of coal in 1893 was $1.14; in 1894, $1.09; a decrease of five cents. The decrease in bituminous production was due chiefly to the prolonged strike in the spring and summer of 1894.

Welding Copper to Steel.

It is claimed by George Cromley, Cornelius Shay and John Ryan, all iron workers of Pittsburg, that they have discovered a method of welding copper to steel, and as proof of their claim they show samples of the two metals perfectly welded. The value of the discovery lies in the fact that copper offers greater resistance to the action of salt water than any other metal. It has been stated in the daily press that the Carnegie Steel Co. has been negotiating with the discoverers for the use of their process, but its practical value in connection with armoring vessels has been overstated. President Leishman says that the discovery, if such it be, is not especially interesting to his company. The armor of vessels being to a very large extent above water, the question of resistance to the action of salt water is not a vital one.

Received From the Trade.

Round Oak stoves are attractively illustrated and described in a little catalogue just sent out by the manufacturers, the estate of P. D. Beckwith, of Dowagiac, Mich.

Foote, Barker & Co., of Cleveland, have sent out a neat little 12-page folder, calling attention to a few of their tools. Among the tools shown therein are a cutter and reamer grinder, an adjustable two-spindle drill press and a cock grinder.

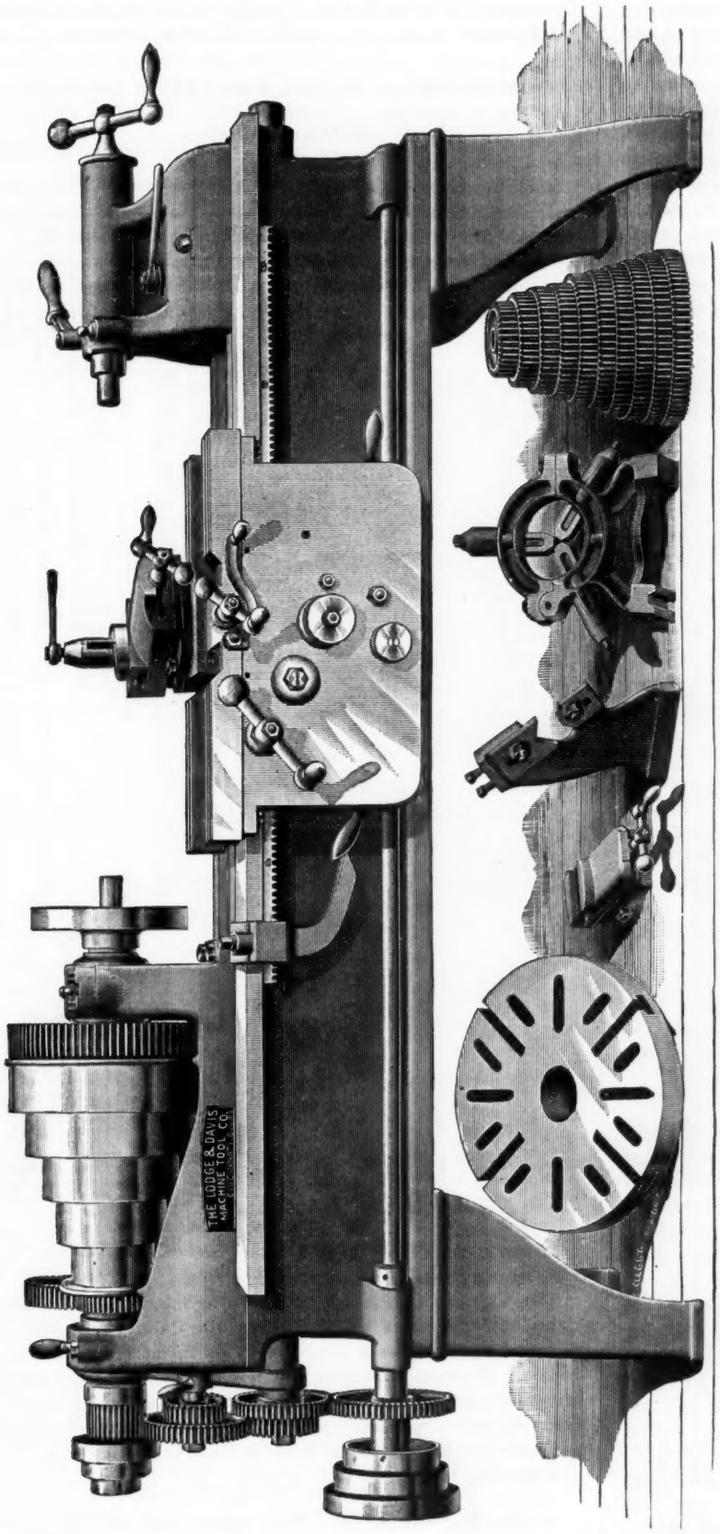
THE Calumet Furnace Co. has been incorporated at Chicago, to operate the Calumet furnace under a lease from the owner, the Calumet Iron & Steel Co. The capital stock of the company is $50,000, and the incorporators are Frederick S. Wheeler, Horace K. Tenney and R. I. Tout.

THE Watertown Steam Engine Co., Watertown, N. Y., has voluntarily increased wages 10 per cent.

IMPROVED TWENTY-INCH LATHE.

The Lodge & Davis Machine Tool Co., of Cincinnati, Ohio, is re-designing its entire line of engine lathes, and we give herewith an illustration of the improved 20-inch lathe.

It will be seen that most of the distinctive features of the lathe have been retained; i. e., it has its lead screw on the inside of the bed; the feed rod can be driven either by belt or gears; the feed motion is taken directly from the end of the spindle, and there is an automatic stop for the feed which can be adjusted to any point on the lathe bed. The feed rod and the lead screw cannot be engaged at the same time.



IMPROVED TWENTY-INCH LATHE.

The cone is now made with five steps and with the back gears gives ten speeds, which are arranged in geometrical progression. A taper attachment is furnished when required, which will bore turntapers up to 6 inches per foot, and is graduated. The tail stock spindle is graduated in 1-16ths its entire length, which is very convenient in boring holes and cutting stock. The cross-feed screw is graduated into thousandths to facilitate tool setting.

The entire lathe is considerably heavier than formerly, and the bearing of the carriage upon the ways has been increased in size.

A LARGE MACHINE.

F. B. Shuster, proprietor of John Adt & Son's machine shop, New Haven, Conn., has completed and is about to ship what is claimed to be the largest automatic wire straightening and cutting machine ever built by this firm or ever built in America. It is designed for straightening and cutting in lengths of twenty-one feet and shorter, brass, copper and steel wire from three-eighths to five-eighths of an inch in diameter. The style of the machines built at this manufactory has been changed and improved and new features added by the present proprietor, which are meeting with general approval from those who are using them. They are constructed with a straightener which revolves continually, through which the wire passes into a long grooved bar or sleeve with an adjustable gauge therein, against which the wire strikes. By the wire striking against this wire or gauge in the guide bar, it operates a lever attachment, which in turn operates the cut-off of the machine. Forked holders are employed in this machine to catch the wire as it is cut off and dropped from the groove in the guide bar. These holders are mounted upon a piece of wrought iron pipe, which is fastened in the base of the machine at one end and at the other is supported by a floor stand. Some of the holders are carried up so as to support the shaft, guide bar and other necessary parts, thus rendering great security and strength to the various parts of the cutting extension.

The large machine spoken of is of such enormous length that it was impossible to obtain a car long enough upon which it could be shipped. To obviate this, it was necessary to build it in two sections, thereby allowing the mammoth machine to be shipped and handled to better advantage. Its weight is over two and one-half tons.

It is to be consigned to Holmes, Booth & Haydens, Waterbury, who are large users of Mr. Adt's patent automatic wire straightening and cutting machines and speak in the highest terms of the quality and quantity of work done by the use of these pieces of mechanism. These machines are, in fact, used by wire mills and manufacturers the world over.

The mechanical force at the Adt factory has been increased nearly 25 per cent since the new proprietor took hold and from the present outlook the force will be increased as much more in a short while.

The machines built by this firm are now used in England, Scotland, Norway, Sweden, France, Canada, Mexico, United States, in fact, in all civilized countries of the globe and manufacturers using them claim they are without equal.

THE molders at Elbel & Co.'s foundry, Canton, O., went on a strike Aug. 9. They demand an increase of 10 per cent. The firm would not grant the advance. About fifty men are affected by the strike.

SHOP AND FOUNDRY NOTES.

Compressed Air in Workshops.—In turning soft steel shafting, it is customary to use water to which a certain percentage of sal-soda has been added, in order that the water may not rust the finished work, and with a keen tool of the proper temper, and wide enough cutting edge to cover the feed, a very smooth and shining surface can be produced. But if the shaft is to be parallel for any great length, this method of finishing will not answer, because the tool will constantly be crowded away from the surface, and this will, of course, produce a tapering shaft. As the tool is being crowded away, it crowds more over the harder portion of the steel than the softer ones, and the result is, in addition to a tapering shaft, also one that is not round. For this reason, a good lathe hand will run his finishing cut dry over journals, and places in the shaft that he is very particular about, but the dry finish is not so smooth, and requires considerable grinding, either by lead-lapping or any other process of grinding, to make it finished. By using a small air jet, that is, air issuing from an orifice of about $\frac{1}{16}$ inch in diameter, the work can be finished very much the same as if water is used. A smooth surface will be produced with this important difference, that the tool will not crowd, and consequently, the shaft will be nearer true and straight when using a compressed air jet than when using water. * * *

The same sized air jet may be used to advantage at different places around the shop. It is excellent for cleaning off benches and machines, and is much to be preferred to the common dust brush used for this purpose. It is also very convenient at the drill press for blowing out the chips, in drilling and tapping bottom holes. * * *

A very convenient little apparatus for testing the shrinkage, deflection and breaking strength of foundry test bars has been in use for the past three or four years. It consists essentially of a 6-inch cylinder, placed on end so as to bring the piston rod against the center of a horizontally supported test bar. The back of the instrument supports three dials or gauges, upon which the readings of deflection, shrinkage and breaking strain are given. The whole apparatus occupies a space of only 28x10 inches. Some experimenting has been done with a view to determine how far it would be practicable and economical to substitute compressed air for the wind blast in melting iron in the cupola, but so far the effort has not been as successful as desired. The case, however, is not hopeless, and future experiments may develop something that is desirable.—[C. O. Heggem in Cassier's.

* * *

Machine Shop Methods.—We often hear complaints from shops in various sections of the country regarding the departure of work in their line to other localities, and attributing it to various causes, usually all but the right one. A careful observer who sees the different plants will be impressed with the difference in tools and appliances, and with few exceptions the prosperous places are the ones best equipped for their work, with improved machinery and methods, and wide-awake mechanics. The exceptions owe ther failure to poor management in some essential particular, investing in tools more heavily than circumstances warranted, or in tools whose work is limited as to variety, and must lie idle so much as to make an unprofitable investment. These points need to be very carefully considered, and probably differ in each case. Shops abound where the tools have been used for twenty years and are fondly preserved as relics, but they usually lose money every day, although there are few exceptions to this rule. Lathes "just as good as new" should give place to others which can produce more and better work as soon as the saving that will be effected makes it profitable to do so, whether the old lathe has been in use one year or a hundred. The shops that are falling behind in the race are those whose equipment is no better or is worse than it was last year, and this is almost independent of location or other conditions except the one of tools and good management. When we see out-of-date tools nibbling away at a piece of work, with enough vibration to remind one of a man with palsy, it is safe to say that the shop next door, with a modern tool which can cut from two to ten times as fast, can underbid it on work of any kind or can make a larger profit on work at the same price. These are the determining factors in machine production to-day, outweighing all others, even the cost of labor; and the sooner it is recognized by all builders the sooner will they find prosperity and fatter pocket-books. It is time to stop bewailing a fate that is caused only by a lack of modern ideas and tools, and which can be more easily remedied now than later. This is one reason for the usual success of new shops with new equipments, and their continued prosperity depends on a continuance of these conditions, namely, in keeping their equipment as near abreast of the times as possible.—[Machinery.

CONDITION OF BLAST FURNACES OF U. S.*

Aug 1, 1895.

Location of Furnaces.	Charcoal.					Bituminous or Coke.				
	Total No. of Stacks.	In Blast.		Out of Blast.		Total No. of Stacks.	In Blast.		Out of Blast.	
		Number.	Weekly capacity.	Number.	Weekly capacity.		Number.	Weekly capacity.	Number.	Weekly capacity.
New England	11	2	230	9	829	..	..	.....	...	.....
New York	6	1	90	5	635	5	2	2809	3	3335
Pennsylvania	13	2	80	11	852	5	3	2168	2	1400
Pittsburgh	.....	.....	.....	.....	.....	24	22	37977	2	3390
Spiegel	.....	.....	.....	.....	.....	2	2	1465	.....	.....
Shenango Valley	.....	.....	.....	.....	.....	16	14	15749	2	1431
Jun. and Con. Vals	.....	.....	.....	.....	.....	17	8	7905	9	4120
Maryland	4	.....	.....	4	310	5	.....	.....	5	5955
Virginia	4	.....	.....	4	210	23	11	6424	12	6645
North Carolina	.....	.....	.....	.....	.....	2	.....	.....	2	745
West Virginia	.....	.....	.....	.....	.....	4	2	1648	2	1600
Ohio—Mahoning Val	.....	.....	.....	.....	.....	12	9	10636	3	3970
East, Cent. & North	.....	.....	.....	.....	.....	17	13	13443	4	4030
Hocking Valley	.....	.....	.....	.....	.....	6	2	1016	4	1520
Hanging Rock	10	4	208	6	630	12	6	1036	6	1594
Kentucky	3	.....	.....	3	865	6	3	1059	3	1380
Tennessee	8	2	361	6	1785	13	6	4586	7	4260
Georgia	3	1	258	2	375	2	1	621	1	740
Alabama	13	3	537	10	2510	38	19	17684	19	11335
Indiana	.....	.....	.....	.....	.....	2	.....	.....	2	275
Illinois	.....	.....	.....	.....	.....	19	13	19141	6	7433
Michigan	20	4	1528	16	5018	.....	.....	.....	.....	.....
Wisconsin	4	2	996	2	445	4	2	1613	2	1540
Minnesota	.....	.....	.....	.....	.....	1	.....	.....	1	665
Missouri	2	.....	.....	2	580	3	1	855	2	1425
Texas	4	1	140	3	845	.....	.....	.....	.....	.....
Oregon	1	.....	.....	1	280	.....	.....	.....	.....	.....
Colorado	.....	.....	.....	.....	.....	3	1	985	2	1598
Total char. and coke.	106	22	4428	84	16169	241	140	148820	101	70386
Total anthracite (New York, New Jersey, and Lehigh, Schuylkill, Upper and Lower Susquehanna and Lebanon valleys.)	129	38	20847	91	38095	.....	.....	.....	.....	.....

SUMMARY.

Fuel.	In Blast.						Out of Blast.			
	Number.			Weekly Capacity.			Number.		Weekly Capacity.	
		Month Previous.	Year Previous.		Month Previous.	Year Previous.		Month Previous.		Month Previous.
Charcoal	22	16	24	4,428	3,284	4,070	84	90	16,169	17,169
Anthracite	41	38	33	23,257	20,847	16,414	88	91	36,350	38,095
Coke	140	133	78	148,820	140,448	94,022	101	105	70,386	74,221
Total	203	187	135	176,505	164,879	114,506	273	286	122,905	129,485

*The above table is condensed from the *American Manufacturer*.

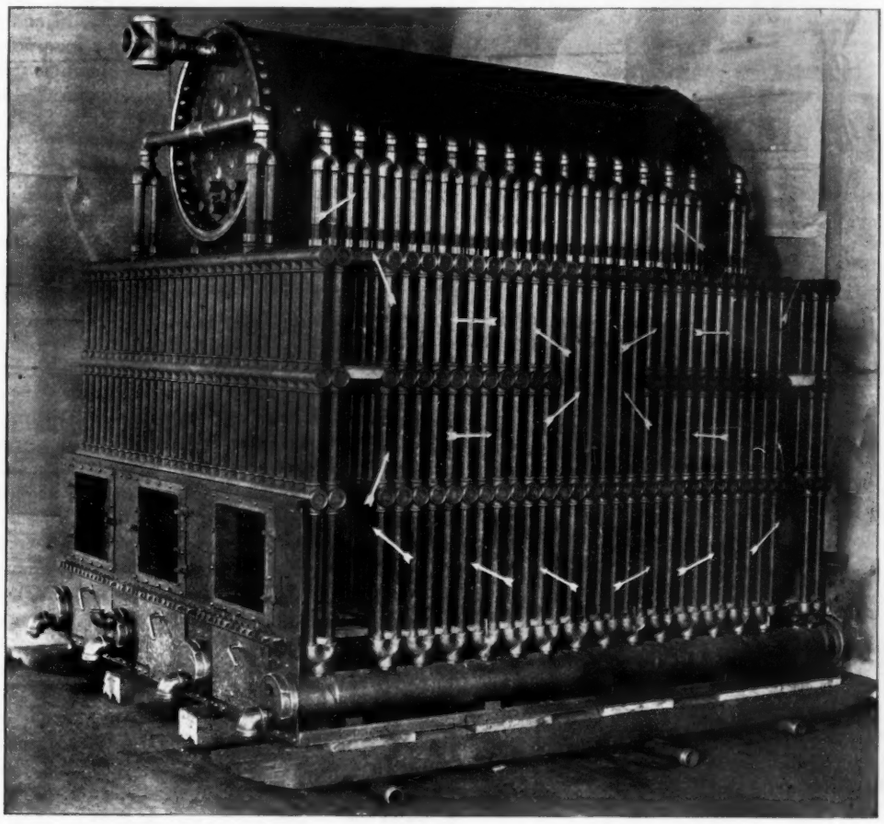
THE Calumet Iron & Steel Co., Chicago, have leased to the Calumet Furnace Co., a new concern, the Calumet Furnace at Cummings, near South Chicago. This furnace has a weekly capacity of about 1,600 tons, and has heretofore turned out a superior grade of iron. It has been idle for several years. Repairs and improvements are now being made and will probably be completed in time to blow in about the end of the month.

ON Monday, Aug. 5, the Griffin Wheel Co. put in operation three floors of the addition to its wheel foundry in Sacramento avenue, in Chicago. This addition, when completed, will have seven floors, and 50 annealing pits, and will increase the output of the works to 800 wheels a day.

THE plant of the Atlanta Steel & Tin Plate Co., at Atlanta, Ind., is to be enlarged and doubled in capacity, work to begin at once. The stock has been subscribed by Kokomo and Eastern capitalists. The capital is $150,000.

THE TAYLOR SECTIONAL BOILER.

The Taylor water-tube boiler, illustration of which is shown herewith, is made up almost entirely of upright steel tubing, the tubes being only two feet in length from the first corrugated crown-sheet to dome, thereby, it is claimed, reaching the maximum in late practice, for short and rapid circulation. The steam is almost entirely separated from the water in the upper manifolds at the top of the tubes, before entering the dome. It thus furnishes uniformly dry steam. The water-line is as steady as in a Scotch marine boiler. The heat after operating on the first corrugated crown-sheet, passes each way to the ends of the combustion chamber, where it ascends the vertical flue, then passes horizontally through the first series of upright tubes, under the second corrugated crown-sheet, to the center. There the crown-sheet is left out, making a flue to the upper or third crown-sheet, under which the heat passes horizontally through the upright tubes to the vertical flues at each end. From there the heat goes under the dome and heater-pipes (the latter not shown in photograph), to the stack, which is located centrally or at either end as required. There are two large down-flow pipes at the back end of the boiler for return of water to four bottom manifolds, from which arise 128 1¼″ pipes to supply the sections with water, there being four pipes to each section, or four rows of 32 each, making three fire holes. The grates are made to revolve so as to be able at any time to clean the fire quickly and easily.



THE TAYLOR PATENT UPRIGHT WATER-TUBE SECTIONAL BOILER.

The boiler from which this photograph was taken was put into the steam yacht "Azalea," (125 feet long, 18 feet beam) which has just returned from a trip to the Thousand Islands, a distance of 1,200 miles. During this trip 21 tons of coal were used, the boat being under steam sixteen days, but running only by daylight, and part of the time passing through the Welland Canal. This boiler occupies about seven feet square of floor space, and has 1,400 feet of heating surface. It furnishes steam for a triple expansion engine with cylinders, 9¼″, 14½″ and 24″ by 14″ stroke, 300 revolutions per minute and maintains a pressure of 200 lbs. The stack is painted white and after traveling more than 2,000 miles, shows no blemish whatever, showing that there is no waste heat going through the stack.

The boilers are being manufactured by the Detroit Screw Works, Detroit, Mich., who own the patents.

PERSONAL.

A short notice was given in these columns last week of the death of Mr. E. F. C. Davis, the president of the American Society of Mechanical Engineers, who was accidentally killed while riding in Central Park, New York, on the evening of Tuesday, Aug. 6. Mr. Davis came to New York from Richmond, Va., in April to take charge of the C. W. Hunt Co.'s iron works. He was born in Richmond, Va., 48 years ago. After leaving college, he entered the employ of the New Castle, Del., Iron Works. Later, he was connected with the iron works at the Atlantic Dock, Brooklyn. In March, 1878, he became one of the mechanical engineers at the works of the Philadelphia & Reading Coal & Iron Co., at Pottsville, Pa. He was for four years one of the engineers in charge of the Richmond Locomotive Works. In November, 1881, he joined the American Society of Mechanical Engineers. He was nominated for president of that organization at the general convention at Montreal in the spring of 1894 and was elected in November last.

James C. Warner died at his residence near Nashville, Tenn., on July 22, after a long illness. He was born at Gallatin, Tenn., in 1831. A few years ago, Mr. Warner retired from active business owing to ill health. Up to that time he had been most actively engaged in developing the iron industry of Tennessee and Georgia. He was a manufacturer of pig iron at Rising Fawn, Ga., at Chattanooga and Warner, Tenn., and at other places. The Warner Iron Co., which he created, owned several charcoal furnaces. A few years ago it was consolidated with the Southern Iron Co., now the Central Iron Co. Mr. Warner was also at one time the president of the Tennessee Coal, Iron & Railroad Co.

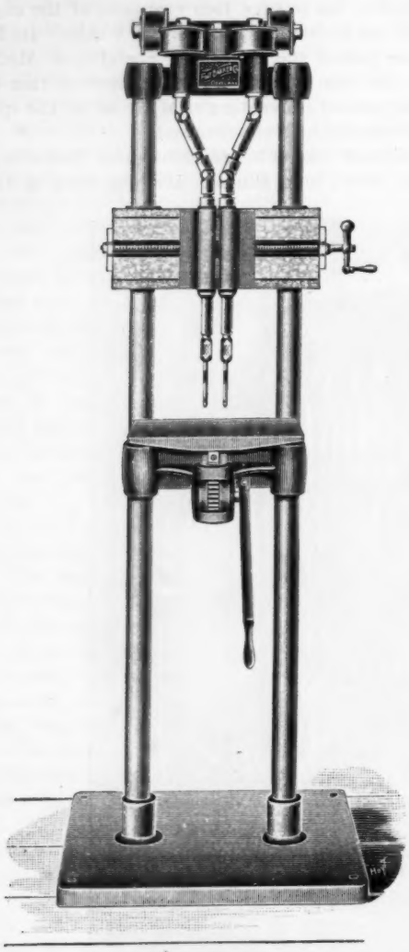
Albert Fisher, of Fisher & Porter, 1025 Monadnock Block, Chicago, western agents for the Bethlehem Iron Co., was in Cleveland last week looking up business for his concern. While in Cleveland Mr. Fisher closed a contract with the Globe Iron Works for the entire outfit of forgings, shafts, cranks, connecting rods, etc., for the engines to go in Revenue Cutter No. 1, now being built for the U. S. Government by the Globe Iron Works.

THE plant of the Central Stamping Co., Newark, N. J., was destroyed by fire on August 11. The loss is estimated at $500,000; insurance, $250,000.

ADJUSTABLE TWO-SPINDLE DRILL PRESS.

This machine is designed to meet the wants of those having work where two holes can be drilled at once, and at variable center distances, also for light vertical milling. The spindles are driven by universal joints, are of tool steel ⅞ inch diameter and 6½ inches long in bearing.

They are carried in bearings, which slide on the crosshead, and are moved either toward or away from each other by means of a right and left-hand screw. They can be set to drill holes from 1¼ to 12 inches center distances. Present size of machine will carry two 5-16 inch drills, and all sizes smaller. The machine complete weighs about 300 pounds.



It is manufactured and sold by Foote, Barker & Co., Cleveland, O., who will send further details on application.

THE blast furnacemen in Sharon and Sharpsville all returned to work on Monday, the third advance of 10 and 15 cents having been granted by the officials. The men threatened to strike if the officials did not withdraw certain conditions which had been imposed with the advance. The companies, however, satisfactorily disposed of the question raised by the workingmen. The turn men are now receiving $1.65 per day and laborers $1.35.

THE iron ore and furnace properties of the Central Iron Co., located in Davidson, Hickman, and Hamilton counties, Tenn., are to be sold to the highest bidder at Centerville, Tenn., on Aug. 17. It is said that a reorganization will be effected immediately after the sale and a new company formed, to be known as the Buffalo Iron Co.

IT is reported that a number of Eastern capitalists have been in Alliance, O., looking over the ground with the view of establishing a steel plant near that city.

THE Bethlehem Iron Works last week made its first installment of armor plate for the Russian Government. Thirteen plates were shipped, each weighing twenty-six tons.

INDUSTRIAL SUMMARY.

New Buyers in the Market, and Some of Their Wants:—

[If you are in need of machinery of any description, please notify *The Iron Trade Review* and we will put you in communication with our advertisers at once.]

The Premier Bicycle Co. has been formed at Bridgeport, Conn., with a capital stock of $125,000.

L. Sonnenschein, 127 Market st., Chicago, wants to buy a good second-hand fire-box boiler, 15 to 20 horse power, with fittings and stack.

A. T. Stewart & Co., Grand Crossing, Chicago, Ill., want to buy a second hand upright boiler and engine, connected, of 10 to 15 horse power.

The Cleveland (O.) Gas Engine Co. has just been organized for the purpose of manufacturing gas and gasoline engines from one to ten horse power.

"W. S. S." 801 Stock Exchange Bldg., Chicago, wants to buy a double drum hoisting engine with upright boiler, suitable for pile driving; two cylinders, 7 or 8x10.

The Potter & Hollis Engineering Co. has been incorporated at Chicago to do a general mining business. Incorporators, Edward C. Potter, Henry L. Hollis and James S. Harlan.

The Thistle Cycle Co. has been incorporated at Chicago, with a capital stock of $2,500, to manufacture cycles. Incorporators, Walter P. D. Haman, Edwin A. Munger and Ward M. Fowler.

Bids are solicited for constructing the Southern Railway Co.'s machine shops in Atlanta. They include one building 120x120 feet besides several enlargements. C. H. Hudson is chief engineer.

Holmes & Peterson, Jamestown, N. Y., will erect a machine shop at Falconer, N. Y., 40x80 feet, two stories high, and will require engines and boilers of 30 horse power, iron and sheet metal working machinery.

The Potter & Hollis Foundry Co. has been incorporated at Chicago, with a capital stock of $10,000, to do a general foundry business Incorporators, Edward C. Potter, Henry L. Hollis and Michael Schmidt.

The Benjamin Iron & Steel Co., with a capital of $100,000, has been organized at Buffalo, N. Y., to carry on a scrap iron and steel business. Mr. Cornelius J. Kane, of Pittsburg, was elected secretary and treasurer.

The Superior Foundry Co. has been incorporated at Little Falls, N. Y., with a capital of $20,000 to manufacture and sell furnaces, etc. The directors are Victor Adams, W. H. Switzer, C. W. Vosburgh and F. H. Burrows.

The firm of George Sears & Co., Clinton, Ia., has recently been organized for the manufacture of the Sears blacksmithing machine, which is a combined shears, punch, round iron cutter, tire upsetter and shoe sharpener.

R. H. Casson, late of the rod department of the Rogers Locomotive Works, Paterson, N. J., has started a machine shop at 193 Liberty street, Paterson, N. J., where he will build special machinery and do jobbing of all kinds.

The Tinkham Cycle Co., incorporated recently, with a capital stock of $100,000 will manufacture bicycles and carrier tricycles. The officers of the new company are: Julian R. Tinkham, president; Ernest F. Walton, treasurer and general manager, and Lloyd McKim Garrison, secretary.

Application has been made for the incorporation of the Reading (Pa.) Tin Plate Co. The incorporators are Howard McIlvain, Lewis Crater, Charles A. High, Morton L. Crater, and Walter S. Young. The company proposes to buy black plates at the start, but eventually expects to have a complete plant, including a rolling mill.

The Malleable Iron & Steel Works, which have been under construction for some time at Toronto Junction, Canada, have commenced operations. The officers of the firm are: General manager, Mr. Leigh; foreman of molding department, John J. Johnson; head of machine department, W. J. Gore; secretary-treasurer, C. C. Going.

New Construction:—

Thos. Cascaden, of Waterloo, Iowa, has commenced work on a new foundry.

George Bemarkt will erect a new foundry and machine shop at Kansas City, Mo.

W. K. Henderson is contemplating the building of a plow factory at Jefferson, Tex.

Howard N. Babcock, treasurer of the Ranton Boiler Co., is to build a foundry at Syracuse, N. Y.

Advices from Jacksonville, Fla., report that the plant Railway & Steamship Co. is about to select a site for machine shops at some point on its line.

C. Hanika & Co., of Muncie, Ind., have purchased the plant of the Muncie Architectural Iron Co. and will proceed to replace the buildings recently destroyed by fire.

Jas. C. O'Brien will build an iron foundry on Carroll avenue, near Robey street, Chicago. It will cost $5,000 and will be equipped with all the latest foundry improvements.

The Barberton (O.) Art Tile Works will build shops 240 feet square, one-half to be two stories high. The steam plant required will be 250 horse power in boilers and a 100 horse power engine.

Otis Allen & Son, Lowell, Mass., are erecting a brick factory 150x60 feet in size, four and one-half stories high. An engine and boiler plant to develop 500 horse power will be required, together with an electrical equipment for lighting the building.

Additions, Enlargements, Removals, Etc.:—

The Vaughn Machine Co., South Peabody, Mass., will enlarge their works by the addition of a foundry, 90x50 feet in size.

The Baltimore Malleable Iron & Steel Casting Co. is making extensive additions to its plant which will double the capacity of the works.

Geo. Brown's Sons, of Mt. Joy, Pa., have commenced work on a new boiler house at their mills. They propose to put in boilers of greater capacity.

Speidel & Roeper, of Reading, Pa., have added a chain shop to their works for the manufacture of chain hoists, hand traveling cranes and overhead tramways.

The Cambria Iron Co., of Johnstown, Pa., proposes to build a new 14-inch mill in connection with the Gautier works, the present mill not being sufficient to meet the demands.

The Springfield (Mass.) Forging Co., has erected a two-story addition about 60 by 75 feet. The new addition will call for a considerable increase in the number of hands employed, requiring some 30 men additional. The capitalization has been increased from $15,000 to $30,000.

The Consolidated Barb Wire Co., of Lawrence, Kan., and Joliet, Ill., will make an important improvement in its Joliet plant. The new buildings will consist of an addition to the wire mill 100x150 feet in size and a wire nail mill of the same dimensions. This addition will increase the present capacity of the mill by about 100 tons per day. The nail mill will contain 50 machines, whose product will be wire nails and spikes.

Ball Bros., of Muncie, Ind., have let the contract to the Indiana Bridge Co. for the erection of another iron building. The old part of factory No. 1 has been torn down and the new structure will cover that space. It will be used for the presser department, which will be increased with two new furnaces, making in all 45 shops employing alone in this department 200 hands. Four new tanks will be built, and one of the three old ones will remain standing.

The Chicago Hardware Mfg. Co. will build an extensive plant at North Chicago, Ill., and move its business there from Chicago. This step has been taken on account of the limited size of the present property, it being found necessary to arrange for new buildings of sufficient capacity to accommodate the growth of the business. The entire plant will comprise a number of modern buildings with facilities up to date in every respect, and will cover four acres. Ground will be broken at once, and it is proposed to have the works completed by Jan. 1, when the company will give employment to a large number of skilled workmen, which force will continue to increase with the growth of the business. The present capital of the Chicago Hardware Manufacturing Co. is $300,000, paid up.

Fires and Accidents:—

The Union Iron Works, of Decatur, Ill., were destroyed by fire Aug. 6. The loss is $80,000, with insurance of $23,000. Patterns worth $50,000 were burned, but a few patterns were saved. Business will be resumed soon.

General Industrial Notes:—

The Keystone Plow Co., of New Castle, Pa., has failed.

Crum Lynn Iron Works, Chester, Pa., will start up soon.

The North Cornwall, Pa., furnace will blow in soon on Bessemer.

Lane Bro's. bridge works, Newark N. J., have advanced wages 10 per cent.

Watt's Iron & Steel Syndicate, Middlesboro, Ky., have advanced wages 10 per cent.

Pulaski, (Va.) Iron Co.'s furnace, which has been out of blast for some time, has blown in.

The foundry of Bussey, McLeod & Co., which has been closed for some time, has started up again.

The employes of the Aetna-Standard Iron & Steel Co., have been given an advance in wages of 10 per cent.

The Glendon Iron Co., of Easton, Pa., has men at work day and night getting its No. 3 stack ready for blast.

The Newark, (N. J.) Machine Works, has just received a large order from Germany for machinery, and is working full time.

The Dunbar (Pa.) Furnace Co., has bought one of the blowing engines of the Elmira, N. Y. furnaces, which are being dismantled.

It is announced that the nail factory of the Atlantic Iron Works, Sharon, Pa., will reopen, Aug. 19, after an idleness of over two years.

The Edgemore Iron Co., Wilmington, Del., has advanced the wages of its employes 10 per cent, to take effect Aug. 10. Five hundred workmen are affected.

No. 1 furnace of the Sloss Iron & Steel Co., Birmingham, Ala., has been dismantled and will be torn down. A new furnace 80x18 will be erected in its place.

The New Castle (Pa.) Wire Nail Co. is again increasing its steam power, and two tubular boilers are being put in by the Bass Foundry & Machine Co., of Ft. Wayne, Ind.

The plant of the Ironton Structural Steel Co., at Duluth, Minn., has been completed and was started up Aug. 8. It consists of a rolling mill and open hearth steel furnace.

All the miners and furnace men of the Valentine Iron Co., at Bellefonte, Pa., have been granted a voluntary increase of 10 cents per day in wages. The order affects 400 men.

The Wright Engine Works, of Newburg, N. Y., has been sold to Samuel McMillan, of New York. The plant includes a machine shop, foundry, blacksmith shop and office building.

It is reported that the nail mills of the Portage Iron Works, Duncanville, Pa., will resume shortly under the management of A. R. Whitney & Co., of New York, after being shut down since 1873.

No. 1 blast furnace of the Pennsylvania Steel Co., at Steelton, Pa., has been blown out for relining. This furnace was put in blast on September 16, 1891, and has been in successful operation ever since.

J. H. King, of Painesville, president of the Cherry Valley Iron Works, Leetonia, O., has sold out to C. N. Schmick and S. E. Welker, and W. H. Potter, of Toledo. Mr. Schmick will be president and treasurer.

Excelsior furnace, at Ishpeming, Mich., which shut down for repairs recently, will be put in blast as soon as they can be completed. The casting house is to be enlarged, a new hot blast put in and a new engine installed.

The Whiting Foundry Equipment Co., Chicago, has just erected two additional floor cranes for the Jackson & Woodin Manufacturing Co., Berwick, Pa., which will increase the capacity of the wheel foundry to 240 wheels per day.

The Quast Gas & Gasoline Engine Works, Bucyrus, O., has been completed and is about ready to start, all the necessary machinery being in place. Work will be commenced as soon as a few minor improvements are made to the engine.

Repairs on the Soho furnace of the Pittsburg Iron & Steel Co., have been completed, and the furnace was blown in last week. Work will begin in the rolling mill as soon as the blast furnace has turned out a stock of pig metal. The entire mill will probably be running by August 19.

The Anniston, (Ala.) Pipe & Foundry Co. has secured the contract for 30,000 tons of iron pipe to go to Yokohama, Japan. It is stated that this is the largest contract for iron for foreign

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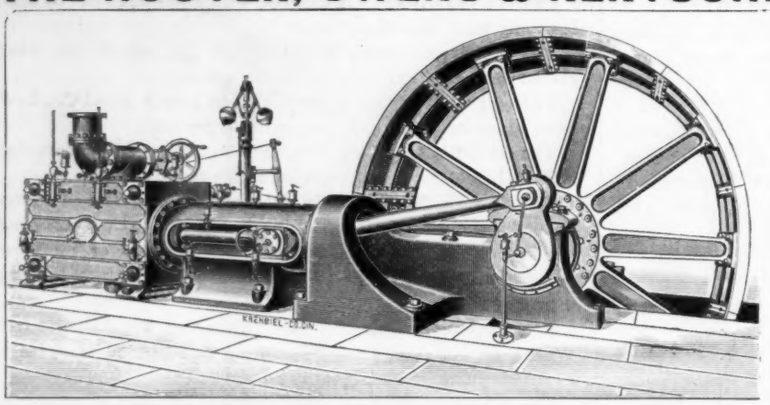

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shipment ever secured by any American house, and was secured in competition with the leading manufacturers of Europe.

J. V. Rose, proprietor of the Sharon Fire Brick Works, of Sharon, Pa., has received a contract for 2,500,000 bricks to be used in the erection of a large blooming mill in a western city, and has completed the work of lining the Spearman Iron Co.'s furnace. He has commenced work on the Perkins furnace, at Sharpsville, Pa.

The open hearth department of the Pennsylvania Steel Co., at Steelton, for the month of July, made over 12,000 tons of steel, being the largest tonnage in the history of the plant. The blast furnaces are producing large quantities of No. 1 iron and spiegel. The repairs to No. 1 are being pushed, and it is expected to have it in blast again in about one month.

The Fitchburg Machine Works, Fitchburg, Mass., is prepared to design and build special machinery of all kinds to order, and because of its excellent shop facilities and experienced working force it is in a position to do such work to advantage. This department is separate from the machine tool business, and will not interfere with prompt shipments of regular product.

The Reading Iron Co., of Reading, Pa., will control and operate the rolling mills at Danville, run heretofore by the Montour Iron & Steel Co. The plant will be known as the Montour Rolling Mills Department of the Reading Iron Co., and is expected to be in full operation soon. Grooved skelp iron, merchant bar iron, angle iron and splice plates and light rails will be made.

The Tonawanda (N. Y.) Iron & Steel Co. will soon erect another stack a little larger than No. 1. The new furnace will be 80x18 feet, equipped with three Kennedy-Cowper hot blast stoves. The James P. Witherow Co. will furnish the iron work of the stoves, and the Lake Erie Engineering Co., of Buffalo, has taken the contract for the large blowing engine, which will be a double compound condensing engine, with two air cylinders 84 inches in diameter, two high pressure steam cylinders 40 inches in diameter, and two low pressure steam cylinders 78 inches in diameter. Work is being actively pushed, and it is expected the furnace will be in blast some time during the winter.

E. L. LeBaron, of Middleboro, Mass., is considering an offer to establish the foundry, recently burned, at Brocton, Mass. Large inducements are offered for location there, and the executors of the E. P. LeBaron estate are inclined to look at it in a favorable light. Work of rebuilding at the old place will begin next week, and temporary sheds will be erected in order that the work may go on, and the large number of orders now on hand may be filled.

The Chicago Shipbuilding Co. has closed a contract with a Cleveland syndicate for the construction of a steel schooner of the 6,000 ton class. The new boat will be a duplicate of the two steel schooners which will be built at the Calumet shipyards for the Minnesota Steamship Co. The schooner will be 352 keel, 365 feet over all, 44 feet beam, and 26 feet depth of hold. Her cost will be about $175,000. The new boat will be ready for business at the opening of navigation next spring.

Twenty-four metal carriers at the Monongahela furnace, McKeesport, Pa., caused a complete shut down last night by striking for $2.25 per day and 13 per cent tonnage. They were receiving $2.05, with 11 per cent tonnage. They were offered the same tonnage and the $2.25, but refused to accept. About 500 men were obliged to quit work on account of the strike. The furnace has been running for over a year, and may not be started for several weeks, as it is intended to make needed repairs.

H. E. Collins & Co., sole sales agents for the Cahall vertical water tube boilers, have established a branch office at No 24 South Water street, Cleveland, Ohio, in charge of Mr. John R. Bitner, a branch office at No. 71 Perin Building, Cincinnati, Ohio, in charge of Mr. Alex. H. Lewis, and one at 712 Union street, New Orleans, La., in charge of Mr. Lewis Metesser. These gentlemen have all been connected with the boiler business in different fields and are all capable, earnest and

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energetic men, and give great promise of extending the field of the Cahall boilers even beyond the original expectations of either the manufacturers or the original promoters.

The Colorado Fuel & Iron Co., Pueblo, Col., reports as follows: "We are still taking more orders in our merchant iron department than we can fill, and hope to get the new furnaces in by the end of this week, which will help materially. The Spinke mill is also very far behind on orders. By end of week every coke oven we have will be in blast. This is the first time since the drop in silver that the company has sufficient demand for coke to keep all ovens in blast."

The Jewett Mfg. Co., of Buffalo, N. Y., have received a letter from Schoellkopf & Co., of the same city, in recommendation of the system of the Buffalo Forge Co., which is in part as follows: "Replying to your favor of the 29th ult., inquiring as to the results of our experience in the use of the forced-draft system supplied by the Buffalo Forge Co., will say that we are even more impressed with the advantages accruing from its use than when we furnished them with our first letter of approval about a year ago. No matter how damp or foggy the atmosphere we have no difficulty in obtaining all the draft required. As regards smoke, we find the system reduces this baneful nuisance to a minimum."

Fisher & Porter, 1025 Monadnock Block, western agents for the Bethlehem Iron Co., report that the business outlook in their line is very encouraging, and that they have done more business in the past two months than during the preceding first five months of the year. Showing the diversity of uses for which their forgings have been required, they mention the following: Hollow plungers for hydraulic elevators; hollow quills for malt house and grain elevators; hollow forged cylinders and shafts for ore separators; hollow piston rods of nickel steel for rock drills and channeling machines; sockets for drills for coal mining machines; hollow forged shafts for electric railway engines, West Chicago St. R. R.; hollow piston rods for blooming engines for Ohio Steel Co., Youngstown, Ohio, and Apollo Steel Co., Vandergrift, Pa.; hollow shafting for rotary gas engines; hollow spindles for lathes; hollow forged nickel steel piston rods for drop hammers; crossheads and pins, cranks and pins, connecting rods, piston rods, rocker arms, cam shafts, main shafts, etc., for stationary engines and pumps of all sizes, also for ice machines and air compressors; shafts for blowing engines for Carnegie Steel Co., Pittsburg; shafts for rolling mill engines for Illinois Steel Co., Chicago; shafts for electric generators and motors; piston rods and shafts for lake steamers; single, double and quadruple throw solid forged crank shafts for gas engines; shafts and roller shells for ore crushers; stems and rollers for stamp mills; suction and delivery valves for pumping engines; spindles for turret lathes; rail posts for railroad crossings; piston heads and rams for steam hammers; piston rods for drop hammers; axles for gun carriages for U. S Government; polar and declination axes for Yerkes telescope and other smaller telescopes.

MESSRS. FISHER & PORTER, 1025 Monadnock Block, Chicago, western sales agents for the Bethlehem Iron Co., have received the following letter in endorsement of the shafting made by their company:

SAN FRANCISCO, CAL., July 19, 1895.

MESSRS. FISHER & PORTER, CHICAGO, ILL.

GENTLEMEN:—In answer to your letter of July 12, we beg to state that the first materials of the Bethlehem Iron Co. that we used, were the crank and propeller shafts for the U. S. cruiser "San Francisco." The requirements called for 68,000 lbs. tensile strength, 28 per cent elongation. This was exceeded in every shaft, some of them going as high as 73,000 lbs. and 33 per cent elongation, requiring a special request by the Union Iron Works to the Secretary of the Navy, to permit their being used on account of having exceeded the limit allowed by the specifications, being at that time better than any shafts known. Since then we have had the shafts for the sea coast monitor "Monterey," for the cruiser "Olympia," whose engines developed 18,800 horse power, which was distributed to the propellers by two shafts, making 140 revolutions per minute. These shafts were made by your company, and probably for the size and sectional area of them, have delivered the largest horse power of any shaft in the American navy. Also shafts for the battle ship "Oregon:" also the diagonal armor and turret armor for the 13" guns of the battle ship; also crank shaft, 3-throw, single piece for steamer "Pomona;" also propeller shaft for steamer "Australia," and propeller shaft for steamer "State of California;" also crank shafts and piston rods for four 1,200 h. p. electric light engines, piston rods oil tempered, for the Market Street Railway Co. of this city; also crank shafts and piston rods for 1,800 h. p. electric light engine, piston rods oil tempered, for the Mission Street power house, of above named company; also piston rods, hollow and oil tempered for the 900 h. p. engines for running electric generators at Butte, Montana. All of which have been of the very highest grade of material and most satisfactory in their results. Yours respectfully,

UNION IRON WORKS,
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Stop-over privileges will enable excursionists to visit places of summer sojourn along the Atlantic Ocean. Long Branch, Cape May, Asbury Park, Atlantic City, Ocean Grove and resorts on the New Jersey coast are on the Pennsylvania Lines, and may be reached at slight expense fro Philadelphia andm New York by daily excursions thither during the season. Historic scenes in Philadelphia, including Independence Hall with Old Liberty Bell and numerous interesting relics, the United States Mint, Masonic Temple, Fairmount Park, the site of the Centennial, may be visited within the stop-over limit.

Returning, excursionists may make the trip over different routes to be selected at the time tickets to Boston are obtained. By this arrangement the return journey may be made via the Hudson River, Niagara Falls and other attractive places. If excursionists wish to reach home in the most expeditious manner, they should obtain tickets with return portion reading over the Pennsylvania Lines. When big crowds break up and the rush for home commences, it should be remembered the Pennsylvania Lines always meet all requirements and handle passengers expeditiously and satisfactorily.

Excursion tickets to Boston account the Knights Templar Conclave will be sold to all applicants at ticket stations on the Pennsylvania Lines from Aug. 19 to Aug. 25, inclusive. One-half the excursion rate will be charged for tickets to be used by children under twelve and over five years of age. Connecting railways will also sell reduced rate tickets to Boston over these lines. Information concerning rates, time of trains and other details will be promptly furnished applicants to nearest Pennsylvania Line ticket agent, or may be obtained by addressing F. Van Dusen, Chief Assistant General Passenger Agent, Pittsburg, Pa.

THE Midland Steel Co., Muncie, Ind., announces that work will soon be begun on a new addition to their plant. An iron building, 80x120 feet, will be erected and occupied by a three-roll high bar mill. This new department will assist the big rolls, as it will work the steel sheets down to a smaller size after they leave the blooming mill and before reaching the sheet roll.

G. A. R. AT LOUISVILLE.

One Cent Per Mile Over Pennsylvania Lines for National Encampment

The rate to Louisville, Ky., for the Twenty-ninth National Encampment of the Grand Army of the Republic will be based upon One Cent per Mile from Ticket Stations on the Pennsylvania Lines. Excursion Tickets will be sold at that rate September 8th, 9th, 10th and 11th, 1895. The Return Limit will cover sufficient time for an extended sojourn, and will be ample for side trips. Southern Railways are expected to make special rates to historic places, and to commercial and industrial centers, enabling visitors to see the South at slight expense. Low rates have already been arranged for the Chickamauga National Military Park dedication, which takes place shortly after the Encampment at Louisville closes. Excursion tickets to Chattanooga for the dedication will be sold over Pennsylvania Lines Sept. 16th to 19th, inclusive.

Special arrangements may be made by Posts desiring to go in a body, or parties of friends wishing to travel together can be satisfactorily accommodated if they will kindly make their wants known to the undersigned. Valuable information will be cheerfully furnished all applicants, and any required aid in shaping details will be promptly extended. It will pay to investigate. C. L. Kimball, Ass't Gen'l Passenger Agent, Cleveland, O.

THE Detroit (Mich.) Steel and Spring Co. is erecting a new all steel addition to its spring departments and installing two new 150-horse-power boilers.

IT is reported that a British syndicate, which has been after the harvesting machinery shops of Amos Whiteley & Co., Springfield, O., has bought them, and will take possession Sept. 1.

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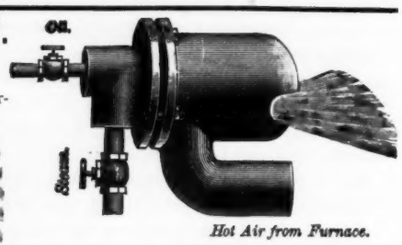

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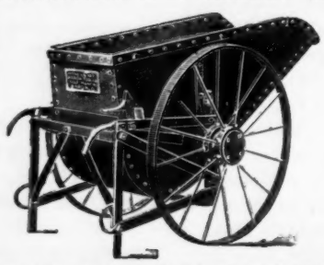

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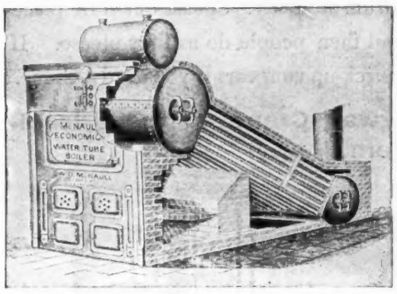

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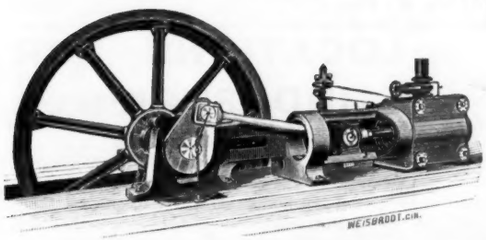

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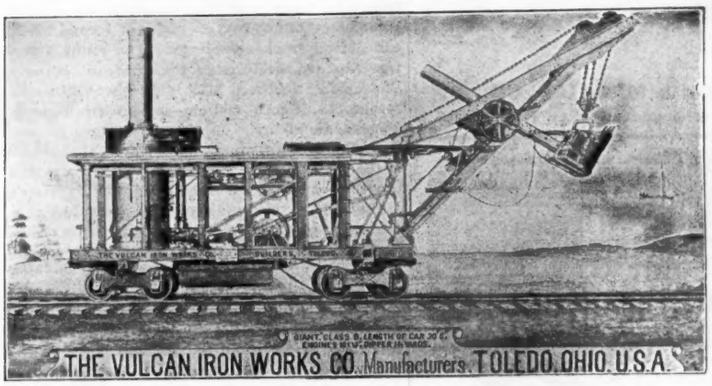

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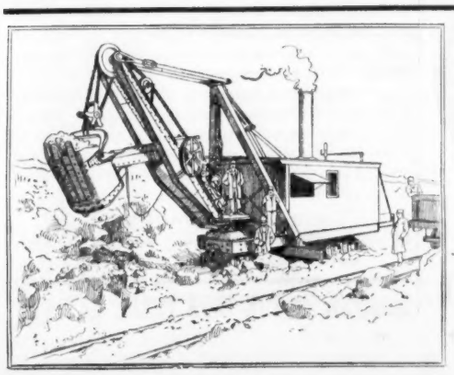

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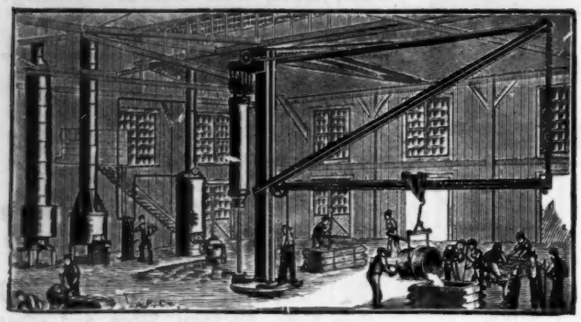

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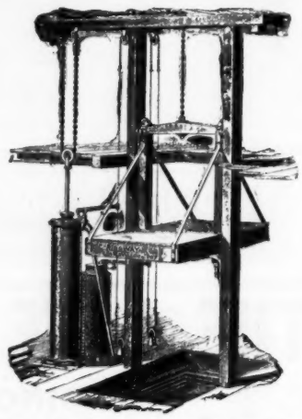
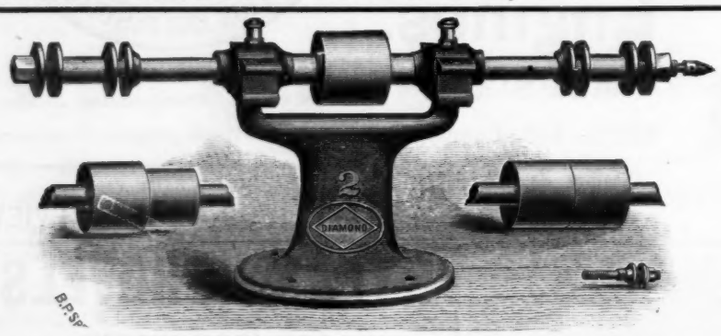


Steam Hydraulic Elevator, also made direct acting with cylinder under platform.



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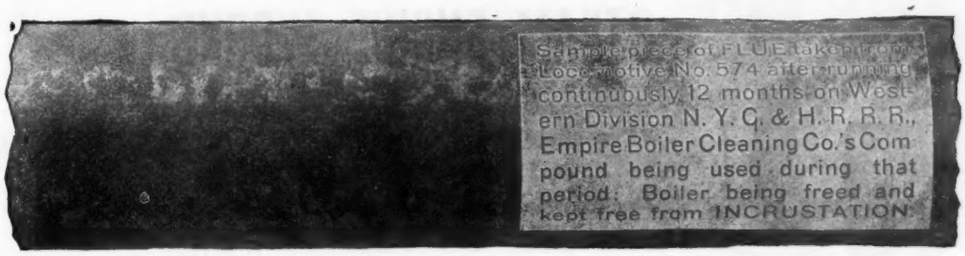
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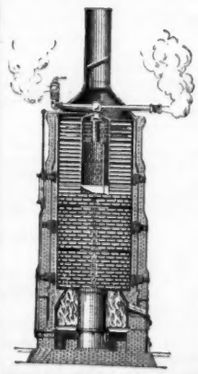

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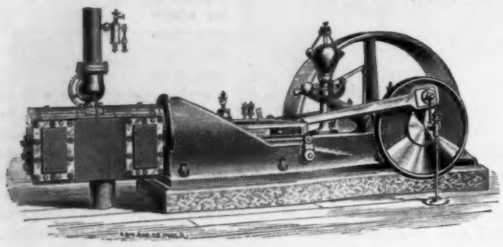

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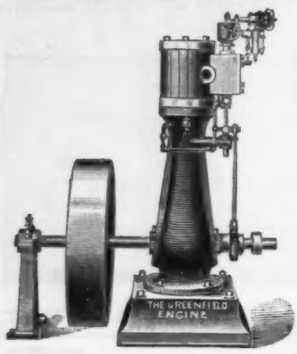

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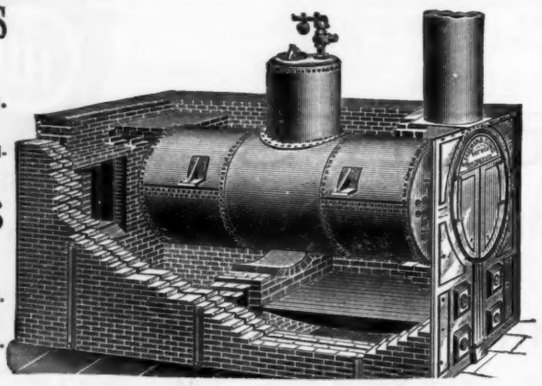

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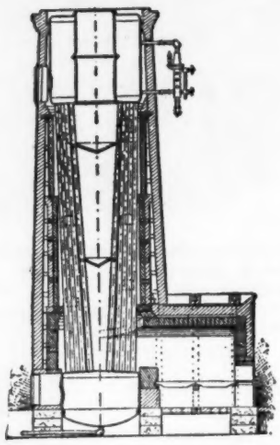

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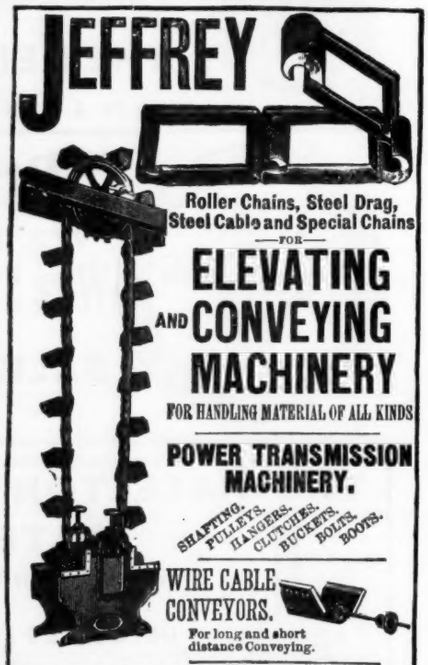

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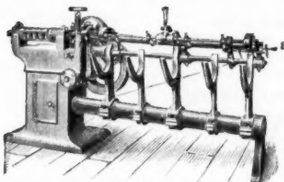

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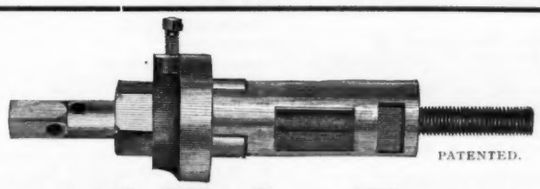

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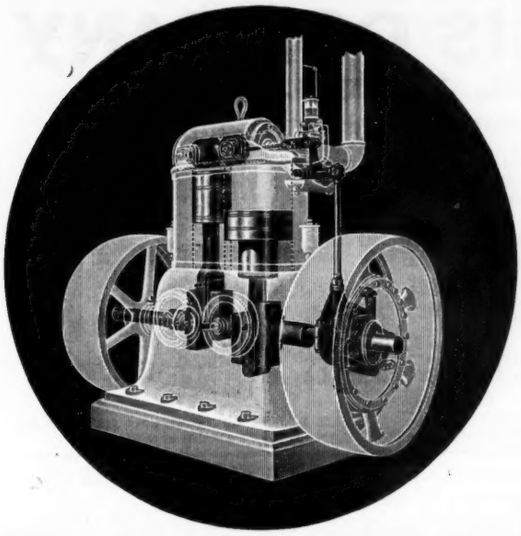

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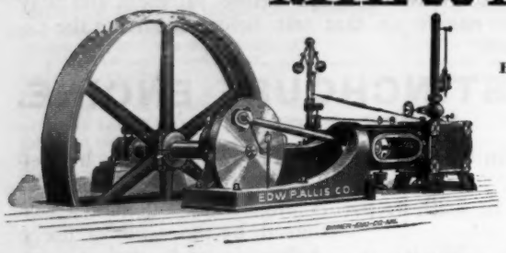

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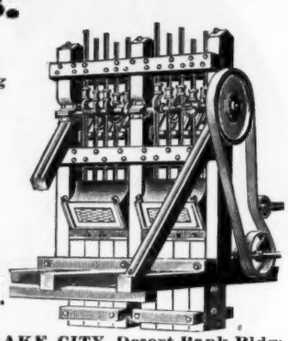

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Westinghouse Machine Co.	25
Westmoreland Fire Brick Co.	27

THE IRON TRADE REVIEW

make it a valuable adjunct to manufacturers of **machine tools, foundry supplies and power equipment.**

CHICAGO HEIGHTS

The Industrial Centre of Chicago

offers **Free Factory Sites** and other inducements.

If you are seeking a new location it will pay you well to investigate the merits of our proposition.

Chicago Heights Land Association

M. H. KILGALLEN, Gen'l Mgr. CHICAGO

IRON AND STEEL MARKETS.

IRON ORE.

[On Lake Erie docks.]

No. 1 Specular, Bessemer	$3.05@ 3.40
No. 1 Bessemer hematite	2.90@ 3.00
Hematites No. 1 non-Bessemer	2.00@ 2.25
No 1. Specular, non-Bessemer	2.35@ 2.75

PIG IRON.

CLEVELAND (f. o. b. cars):	
Bessemer	$14 25
No. 1 Strong Foundry	13 50@ 13 75
No. 2 Strong Foundry	12 50@ 12 75
No. 1 Gray Forge, red short	11 25@ 11 50
No. 2 Gray Forge, neutral	11 00@ 00 00
No. 1 American Scotch	00 00@ 13 65
No. 2 American Scotch	00 00@ 13 15
Lake Superior Charcoal	12 50@ 13 00
PITTSBURG:	
No. 1 Foundry	$12 75@ 13 25
No. 2 Foundry	12 00@ 12 25
Gray Forge	11 25@ 11 50
White and Mottled	10 75@ 11 00
Warm Blast Charcoal	16 00@ 17 00
Cold Blast Charcoal	22 00@ 26 00
Bessemer	14 15@ 14 25
CHICAGO (reported by our representative:)	
Lake Superior Charcoal	$13 50@$14 00
Local Coke Foundry No. 1	14 00
Local Coke Foundry No. 2	13 50
Local Coke Foundry No. 3	13 00
Local Scotch Foundry No. 1	13 50@ 14 00
Local Scotch Foundry No. 2	13 00@ 13 50
Local Scotch Foundry No. 3	12 50@ 13 00
Southern Coke No. 1	10 70@ 11 00
Southern Coke No. 2	12 50@ 12 75
Southern Coke No. 3	12 25@ 12 50
Southern No. 1 Soft	12 50@ 12 75
Southern No. 2 Soft	12 25@ 12 50
Southern Silveries No. 1	14 00@ 14 50
Southern Silveries No. 2	13 50@ 14 00
Jackson Co. Silveries	16 00@ 16 50
Ohio Silveries No. 1	15 00@ 15 50
Ohio Silveries No. 2	14 50@ 15 00
Ohio Strong Softeners	14 75@ 15 25
Alabama Car Wheel	17 00@ 17 50
Malleable Bessemer	14 50@ 15 00
Coke Bessemer	14 50@ 15 00
CINCINNATI (reported by Rogers, Brown & Co.)	
Southern Coke No. 1, Foundry	$12 00@$00 00
Southern Coke No. 2 and No. 1 Soft	11 50@ 00 00
Hanging Rock Coke, No 1	12 50@ 13 50
Hanging Rock Charcoal No. 1, Fdy	16 00@ 17 00
Tennessee Charcoal No 1	13 50@ 14 50
Jackson County Silvery No 1	14 00@ 15 00
Southern Coke, Gray Forge	11 00
" " Mottled	10 75@ 11 00
Standard Alabama Car Wheel	15 25@ 16 25
Tennessee " "	14 50@ 15 00
Lake Superior " "	15 00@ 15 50

OLD RAILS AND SCRAP METAL.

[Prices paid by mills.]

GROSS TONS	
Old iron rails	$16 50
Old steel rails	14 00
NET TONS	
No. 1 R. R. wrought scrap	$14 00
No. 1 wrought scrap	11 00
No. 1 Machine cast scrap	10 00
Iron axles	18 00
Axle turnings	9 50
Wrought turnings (free from cast)	9 00
Cast borings	8 00
Uncut wrought iron boilers	5 00
Steel boiler plates	10 50
Grate bars	7 50
Pipes and flues (clean)	9 00
Tank iron	10 50
Hoop and band iron	7 00
Sheet iron	8 00
Wrought drillings	8 00
Malleable iron	9 00

STRUCTURAL MATERIAL.

Beams and Channels (Cleveland mill)	1.60c@1.65c
Angles	1.50c@1.55c
Tees	1.65c@1.70c
Universal Plates	1.55c
Sheared Plates	1.65c

MERCHANT IRON AND STEEL.

[List prices out of store.]

Flat Bar.

1½ to 4 by ⅜ to 1 inch	1 25
4½ to 6 by ⅜ to 1 inch	1 30
1½ to 6 by 1⅛ to 2 inch	1 45
1¼ & 1⅜ by ⅜ to ¾ inch	1 30
1 & 1⅛ by ⅜ to ¾ inch	1 35
⅝, ¾, ⅞, by ⅜ to ⅝ inch	1 45

Frank P. Cady, Pres. and Supt.
Geo. H. Bowler, Sec'y and Treas.

THE CADY MFG. CO.

18, 20 and 22 Johnson St., CLEVELAND, O.

SEND FOR OUR NEW CATALOGUE OF Power Presses, Drop Hammers, Punches and Shears, Wire Working and Special Machinery.

PERFORATED METALS

OF ALL KINDS FOR

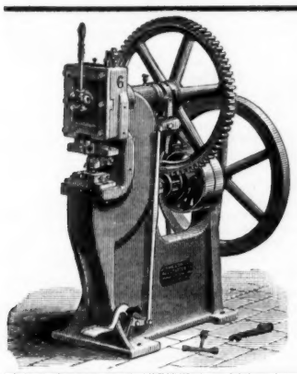
MILLING MINING AND AGRICULTURAL MACHINERY,

PERFORATED IRON, STEEL, COPPER, BRASS, TIN, ZINC, LEAD, ETC., TO ORDER.

LARGE AND VARIED ASSORTMENT OF SIZES. CORRESPONDENCE SOLICITED.

THE ROBERT AITCHISON. PERFORATED METAL CO.,

OFFICE, ROOM 510 265 TO 269 DEARBORN STREET, CHICAGO, ILL. WORKS SOUTH CHICAGO.



THE

LONG & ALLSTATTER CO.

HAMILTON, OHIO, U. S. A.

Manufacturers of Belt, Steam and Electrically driven

POWER PUNCHES AND SHEARS,

for all kinds of Boiler, Tank and Structural Iron Work, Rolling Mills, Locomotive Shops, Car and Wagon Shops, Plow Shops, etc.

Send for Catalogue. (3)

A. H. LEITCH, PREST. JOHN C. LEITCH, SEC. AND TREAS.

WESTMORELAND FIRE BRICK CO. MANUFACTURERS OF HIGH GRADE FIRE BRICKS.

PITTSBURG, PA.

Works and Mines, Westmoreland, Pa.

DIXON'S GRAPHITE PAINT

FOR TIN OR SHINGLE ROOFS AND IRON WORK. IT IS ABSOLUTELY WITHOUT AN EQUAL.

Tin roofs well painted have not required repainting for 10 to 15 years.

If you need any paint it will pay you to send for circular.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

IRON CLAD PAINT CO.

Factory, 75 & 77 Central Way. Sec. & Treas., No. 3 Case Build'g.

CLEVELAND, OHIO.

ORDER DIRECT FROM THE

Iron Clad Paint Co.

And get the genuine article, and save liability of suit for using an article made in violation of the patents issued to Wm. Green, and now owned by this Company.

IRON CLAD PAINT is the most durable, most fire-proof and Cheapest Paint made.

FURNISHED both Dry and Ground in Oil

USED BY NEARLY ALL THE RAILROADS.

Round and Square.

1 to 1⅞ inch	1 25
2 to 2⅝ inch	1 45
2¾ to 3¼ inch	1 40
3⅜ to 4 inch	1 75
4¼ to 4½ inch	2 35
4¾ to 5 inch	2 55

O a'.

⅞ to 1¼ inch	1 45
⅝ to ¾ inch	1 45
½	1 65
⅜	1 85

Half Oval and Half Round.

1¼ to 3 inch	1 80
⅞ to 1⅛ inch	1 60
⅝ to ¾ inch	1 85
½	2 00
⅜	3 10

Heavy Band.

1¼ to 6 by ⅛ and 5-16 inch	1 35
1 to 1⅜ by ¼ and 5-16 inch	1 40
⅛ to ⅞ by ¼ and 5-16 inch	1 50
½ to ⅝ by ¼ and 5-16 inch	1 75

Hoop Iron.

1 7-16 to 4, No. 13, 14, 15 and 16	1 80
1 7-16 to 2, No. 17, 18 and 19	1 85
1 7-16 to 2, No. 20	1 95
1 7-16 to 2, No. 21	2 05
1 7-16 to 2, No. 22	2 15
1⅛ to 1⅜, No. 13, 14 and 15	1 85
1⅛ to 1⅜, No. 16, 17 and 18	1 90
1⅛ to 1⅜, No 19 and 20	1 95
1⅛ to 1⅜, No. 21	2 05
1⅛ to 1⅜, No. 22	2 15
15-16 and 1 inch, No. 13, 14 and 15	1 80
15-16 and 1 inch, No. 16, 17 and 18	1 95
15-16 and 1 inch, No. 19 and 20	2 05
15-16 and 1 inch, No. 21	2 15
15-16 and 1 inch, No. 22	2 25
⅞, No. 13, 14 and 15	2 05
⅞, No. 16, 17 and 18	2 15
⅞, No. 19 and 20	2 25
⅞, No. 21	2 35
⅞, No. 22	2 45
13-16, No. 13, 14 and 15	2 15
13-16, No. 16, 17 and 18	2 25
13-16, No. 19 and 20	2 35
13-16, No. 21	2 45
13-16, No. 22	2 55
¾, No. 13, 14 and 15	2 25
¾, No. 16, 17 and 18	2 40
¾, No. 19 and 20	2 50
¾, No. 21	2 60
¾, No. 22	2 70
11-16, No. 13, 14 and 15	2 50
11-16, No. 16, 17 and 18	2 55
11-16, No. 19 and 20	2 65
1-16, No. 21	2 75
11-16, No. 22	2 85
11-16, No. 23	2 95
⅝, No. 13, and 15	2 55
⅝, No. 16, 17 and 18	2 65
⅝, No. 19 and 20	2 75
⅝, No. 21	2 85
⅝, No. 22	2 95
⅝, No. 23	3 05
9-16, No. 13, 14 and 15	2 75
9-16, No. 16, 17 and 18	2 85
9-16, No. and 20	2 95
9-16, No. 21	3 05
9-16, No. 22	3 15
9-16, No. 23	3 25
7-16 and ½ inch, No. 13, 14 and 15	2 95
7-16 and ½ inch, No. 16, 17 and 18	3 05
7-16 and ½ inch, No. 19 and 20	3 15
7-16 and ½ inch, No. 21	3 25
7-16 and ½ inch, No. 22	3 35
7-16 and ½ inch, No. 23	3 45
⅜, No. 13, 14 and 15	3 45
⅜, No. 16, 17 and 18	3 55
⅜, No. 19 and 20	3 65
⅜, No. 21	4 96
⅜, No. 22	4 05
⅜, No. 23	4 20

Light Band.

1½ to 6 by ⅛ to 3-16 inch	1 55
1½ to 6 by Nos. 11 and 12	1 60
1 to 1⅜ by ⅛ to 3-16 inch	1 60
1 to 1⅜ by Nos. 11 and 12	1 65
⅞ and 13-16 by ⅛ to 3-16 inch	1 75
⅞ and 13-16 by Nos. 11 and 12	1 80
¾ and 11-16 by ⅛ to 3-16 inch	1 85
¾ and 11-16 by Nos. 11 and 12	1 90
⅝ and 9-16 by ⅛ to 3-16 inch	2 00
⅝ and 9-16 by Nos. 11 and 12	2 05
½ by ⅛ to 3-16 inch	2 15
½ by Nos. 11 and 12	2 20

Wagon Box Iron.

⅞ inch, beveled edge, by Nos. 11 and 12	1 75
⅞ inch, " " " " 13 and 14	1 85
¾ inch, " " " " 11 and 12	1 90
¾ inch, " " " " 13 and 14	1 20

Sheet Iron.

No. 10	1 8
No. 12	1 95
No. 14	2 00
No. 15-17	2 10
No. 18	2 25
No. 20	2 40
No. 22-24	2 50
No. 25-26	2 60
No. 27	2 70

Steel Boiler Plates—1-4 in. and Heavier.

Tank	1 80
Shell	1 95
Flange	2 05
Marine Flange	2 40
Fire Box	3 50

Above includes plates 90 inches wide.

90 to 96 in. wide	½c. lb. extra
96 to 100 in. wide	1 c. "
100 to 104 in. wide	1½c. "
104 to 106 in. wide	special

American Cast Tool Steel.

ROUND, SQUARE AND OCTAGON.	cts.	lbs.
1 to 2 in. inclusive		8
9-16 to ⅞ in. "		08½

—FOR—

JESSOP'S STEEL Tools, Drills, Dies, etc.

Established over a Century ago. Manufactory, SHEFFIELD, ENGLAND.

CHIEF AMERICAN OFFICE, 91 JOHN ST., NEW YORK.

WM. JESSOP & SONS, Limited.

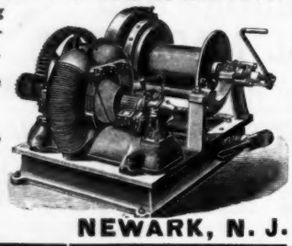
"Medal—World's Columbian Exposition, 1893."

All sizes carried in stock by The W. Bingham Co., Cleveland, Ohio.

HOISTING MACHINERY for Mining, Quarrying, Coal Handling, Pile Driving, Bridge Building, Log Hauling, and for general Contractors' Use. Improved Electric Hoists, single and double Patent Friction Drum, compound, geared with brakes and reversible for general Hoisting, Mining Purposes and Suspension Cable Ways.

Send for Illustrated Catalogue giving full description, etc.

CORRESPONDENCE SOLICITED



W. A. CROOK & BRO'S CO.

Salesrooms 143 Liberty st., N. Y. 117-123 PIONEER ST., NEWARK, N. J.

LIGHT, CHEAP, COOL, DURABLE,

COLLECTS NO MOISTURE FROM UNDER SIDE. NO DRIPPINGS.

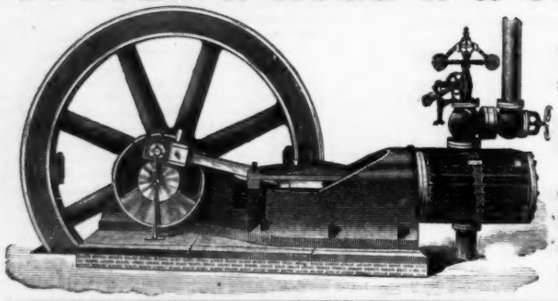
Resists acids and gases arising from inside of FOUNDRIES, IRON WORKS, MILLS, ETC.

Litho-Carbon Paint for Metal Roof sand Sidings Bridges, Smokestacks, etc., covers more space than any other Paint; dries quick, won't crack, peel or blister; will stand a heat of 550° Fahrenheit. Send for 32-page catalogue.

EMPIRE PAINT & ROOFING CO.,

111 No. Fourth St., Philadelphia, Pa.

TOTTEN & HOGG I. & S. F'DRY CO.



Manufacturers of

The "Ætna" Rolling Mill

ENGINE,

Chilled and Sand Rolls and Rolling Mill Machinery.

Pittsburg, Pa.

THE CENTRAL IRON & STEEL CO.

BRAZIL, INDIANA

MANUFACTURERS OF

Wrought Iron Open Hexagonal Turnbuckles,

MADE FROM THE **BEST CHARCOAL IRON.**

Guaranteed Stronger than any Similar Article on the Market.

For 22 Long and Successful years we have made our

"O.K." CROWN

OUR PRICES ARE JUST RIGHT

High Grade Fire Brick, in all shapes and sizes. They have stood the **TEST** with eminent satisfaction to our many customers, because they are made entirely on **HONOR.**

OAK HILL FIRE BRICK AND COAL CO. Manufacturers

OAK HILL, OHIO

7-16 to ½ and 2⅜ to 3 in.	.09
3⅛ to 4 in.	.09½
⅝ to 11-16 and 4½	.10
⅝ to 6 in.	.10¼
¾ to 9-32 and 6¼ to 7 in.	.11
7 in	.13

Flats.

	cts. ℔s.
2 to 9-16 in. wide by 2 to ⅝ thick	.8

Bessemer and O. H. Steel.

Machinery	base price,	1 60
Tire	"	1 70
Spring	"	2 20
Sleigh Shoe	"	2 10
Toe Calk	"	2 15
Cutter Shoes, tapered and bent	"	2 20

English Tool Steel.

Jessop's	15½c
Hobson's "Best"	15½c
" "Choice"	35c

Burden Boiler Rivets.

½, ⅝, 11-16 and ¾ inches diameter	3 30
Bridge ½, ⅝, 11-16 and ¾ inch diam.	3 00

Wrought Pipe and Boiler Tubes.

Lap weld black, base	dis. 67
Butt " " "	dis. 57
Lap " galv. "	dis. 55
Butt " " "	dis. 52
Boiler tubes 2¼" and smaller,	dis. 65 and 5
Boiler tubes 2½" and larger	dis. 67½ and 5
Casing screw and socket joint	dis. 52½
Casing inserted joint	dis. 47½

MACHINERY SUPPLY MARKET.

Anvils.

American	₩ ℔ 9@10
Wright's	₩ ℔ 12

Bellows.

Blacksmiths'	Hill's	dis 40
	Bullock's	dis 50&10
Moulders'		dis 40@40&10
Hand		dis 40&10@50

Belting.

Boston Belting Co.'s standard	dis 70
" " " extra	dis 60&5
" " " best	dis 55
Cleveland Rubber Co. extra standard	dis 60&10
Hoyt's Short Lap	dis 45
Shultz Raw Hide Leather Belting, single	dis 40
Munson's Short Lap Single Leather	dis 50
Munson's Short Lap Double and Light Double Leather	dis 50&10
Shultz Raw Hide Leather Belting, Double and Light Double	dis 40
Standard, oak tanned	dis 50&10
Alexander Brothers' pure oak tanned	dis

Blowers and Exhausters.

B. F. Sturtevant's	dis 20
Boston Blower Co.	dis 35
Buffalo	dis 40

Chucks.

Cushman's 4 Jaw Independent	dis 45
" Combination	dis 40
" Geared Scroll	dis 30
" 2 Jaw Brass Workers	dis 30
" Drill	dis 35
Wescott's Scroll Combination	dis 33⅓
" Independent	dis 40
" Little Giant Drill	dis35
Horton's Universal	dis40
" Independent	dis 45
Whiton's Independent	dis 45
National Combination	dis 40
Sweetland "	dis 40
Almond Drill	dis 20
Morse "	dis 15
Skinner's Combination Lathe	dis 40&10
" Independent Lathe	dis 40&10
" Universal Lathe	dis 40&10
" Drill	dis 20

Cutters and Reamers.

Cleveland	dis 10@15
Pratt & Whitney	dis 10@15
Standard	dis 10@15
Morse	dis 15
Brown & Sharpe, Milling Cutters	dis 15
" " Gear Cutters	dis 15

Crowbars.

Cast Steel	₩ 3½
Iron, steel points	₩ lb 3

Drill and Drill Sockets.

Twist Drills	dis 50&10
Morse Taper and Straight Shank to 1½"	dis 50&10
Morse Taper and Straight Shank Larger than 1½"	dis 25
Drill Sockets	dis 25
Standard Twist Drills	dis 55@55&5
Cleveland " "	dis 55@55&5

Emery.

	No. 4 to No. 46 gr.	No. 54 to No. 150 gr.	Flour, C. F. F. FF.
Kegs, ₩ ℔	4½c	5 c	2½c
½ kegs ₩ ℔	4¾c	5¼c	2¾c
¼ kegs ₩ ℔	5 c	5½c	3 c
10 ℔ cans, 10 in case	6 c	6½c	5 c
10 ℔ cans less than 10	10 c	10 c	7½c

Emery Cloth and Paper.

Barder, Adamson & Co.	dis 50@50&5
H. H. Barton	dis 50@50&5

Emery Wheels.

Detroit	dis 60@70
Norton's	dis 60@70
Grant	dis 60@70
Sterling	dis 60@70
Celluloid	dis 10&33⅓
Northampton	dis 55
Crystal	dis 65@70
Vitrified	dis 60@70
Vulcanite	dis 60&10
Hamden	dis 60&10@70
Cyclone	dis 60@60&10

SHIFFLER BRIDGE COMPANY,

BUILDING DEPARTMENT.

SPECIALTIES: STEEL AND IRON BUILDINGS FOR ROLLING-MILLS, TIN PLATE PLANTS, STEEL WORKS, FOUNDRIES, FACTORIES, ROOF TRUSSES, GIRDERS, COLUMNS, BEAMS, CORRUGATED IRON, ETC.

Main Office and Works:
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Branch Offices:
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65 Dexter Building, Chicago, Ill.
228 Lumber Exchange, Minneapolis, Minn.

FOR YOUR OUTING GO TO PICTURESQUE MACKINAC ISLAND.

ONE THOUSAND MILES OF LAKE RIDE AT SMALL EXPENSE.

Visit this Historical Island, which is the grandest summer resort on the Great Lakes. It only costs about $13 from Detroit; $15 from Toledo; $18 from Cleveland, for the round trip, including meals and berths. Avoid the heat and dust by traveling on the D. & C. floating palaces. The attractions of a trip to the Mackinac region are unsurpassed. The island itself is a grand romantic spot, its climate most invigorating. Two new steel passenger steamers have just been built for the upper lake route, costing $300,000 each. They are equipped with every modern convenience, annunciators, bath rooms, etc., illuminated throughout by electricity, and are guaranteed to be the grandest, largest and safest steamers on fresh water. These steamers favorably compare with the great ocean liners in construction and speed. Four trips per week between Toledo, Detroit, Alpena, Mackinac, St. Ignace, Petoskey, Chicago, "Soo," Marquette and Duluth. Daily between Cleveland and Detroit, and Cleveland and Put-in-Bay. The palatial equipment makes traveling on these steamers thoroughly enjoyable. Send for illustrated descriptive pamphlet. Address A. A. SCHANTZ, G. P. A., D. & C., Detroit, Mich

Cleveland Union Station.

Pennsylvania Lines.

Foot of Bank Street.

TICKET OFFICES at Station, Euclid Av., Woodland Av., and Weddell House corner.

THROUGH TRAINS RUN AS FOLLOWS BY CENTRAL TIME
* Daily. † Daily, except Sunday.

FROM CLEVELAND TO	LEAVE	ARRIVE
Pittsburgh and Bellaire	† 7:00 am	†12:10 pm
Salem and Pittsburg	* 8:00 am	* 8:30 pm
Pittsburgh, Bellaire and East	†12:45 pm	† 6:25 pm
Philadelphia and New York	* 1:40 pm	*11:25 am
Baltimore and Washington	* 1:40 pm	*11:25 am
Alliance and Pittsburgh	* 1:40 pm	*11:25 am
Ravenna and Alliance	† 3:25 pm	† 9:50 am
Hudson and Ravenna	* 5:00 pm	* 8:25 am
Philadelphia and New York	*11:10 pm	* 5:25 am
Baltimore and Washington	*11:10 pm	* 5:25 am
Alliance and Pittsburgh	*11:10 pm	* 5:25 am

Mt. Vernon and Pan-Handle Route

FROM CLEVELAND TO	LEAVE	ARRIVE
Xenia and Cincinnati	* 8:40 am	* 5:15 pm
Akron and Columbus	* 8:40 am	*5:15 pm
Akron, Columbus & Zanesville	†12:45 pm	†12:10 pm
Akron and Orrville	† 3:25 pm	† 9.50 am
Columbus and Cincinnati	* 8:00 pm	* 6:55 am

Valley Ry.

Depot foot of So. Water St.
City Office 137 Superior St.

	Arrive.	Depart.
Akron & Canton	*6:30 P M	*7:10 A M
Akron, Canton & Valley Jctn.	*10:10 A M	*3:15 P M
Valley Jctn. & Way Stations	†6:30 P M	†7:10 A M
Akron, Canton & Chicago	*8:00 A M	*6:30 P M
Wooster and Chicago	†2:45 P M	†11:00 A M
Wooster		†6:30 P M
Akron, Canton & Marietta	†2:45 P M	†11:00 A M
Steubenville, Wheeling, Washington, D. C., and Baltimore	†2:45 P M	†11:00 A M

†Daily except Sunday. *Daily. Pullman's Palace Vestibule Drawing Room cars between Cleveland and Chicago.

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ECLIPSE MUSIC PLATES
ELECTROTYPE ENGRAVING CO.
58 FRANKFORT ST. CLEVELAND

E. C. POPE,

COMMISSION DEALER IN

Iron Ore, Pig Iron AND METALS.

Cleveland - Ohio.

ESTABLISHED 1854.

PETER GERLACH & CO.,

MAKERS OF

Saws, Tools and Machinery.

Office and Warerooms, 28 Columbus St.
Factories on Columbus, Winter and Leonard Sts.,
Cleveland, Ohio, U. S. A.

THE CONDIT-FULLER CO.,

Pig and Bar Iron,

CLEVELAND, . OHIO.

Oglebay, Norton & Co.,

LAKE SUPERIOR IRON ORES.

— AGENTS —

The Spanish-American Iron Co.,
Santiago, Cuba.

CLEVELAND. PHILADELPHIA.

$2.50 CLEVELAND TO BUFFALO

Via "C. & B. LINE,"

Commencing with opening of navigation (about April 1st). Magnificent side-wheel steel steamers

"State of Ohio" and "State of New York."

DAILY TIME TABLE.

SUNDAY INCLUDED.

Lv. Cleveland, 6:00 P.M. | Lv. Buffalo, 6:30 P.M.
Ar. Buffalo, 7:30 A.M. | Ar. Cleveland, 7:30 A.M.

CENTRAL STANDARD TIME.

Take the "C. & B. Line" steamers and enjoy a refreshing night's rest when enroute to **Buffalo, Niagara Falls, Toronto, New York Boston. Albany, 1,000 Islands,** or any Eastern or Canadian point.

Cheap Excursions Weekly to Niagara Falls.

Send 4 cents postage for tourist pamphlet.

W. F. HERMAN, Gen'l Pass. Agt. **T. F. NEWMAN,** Gen'l Manager.
Cleveland, O.

CHICAGO HEIGHTS

The Industrial Centre of Chicago

offers **Free Factory Sites** and other inducements.

If you are seeking a new location it will pay you well to investigate the merits of our proposition.

Chicago Heights Land Association
M. H. KILGALLEN, Gen'l Mgr. CHICAGO

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Chicago Heights Land Association
M. H. KILGALLEN, Gen'l Mgr. CHICAGO

Files.

Arcade	dis 60&10@60&10&10
Nicholson	dis 60&10@60&10&10
" X. F.	dis 25
Kearney & Foot	dis 60&10@60&10&10
Black Diamond	dis 60&10@60&10&10
McClellan	dis 60&10@60&10&10
Disston's	dis 65@70
Western	dis 70
Stub's	dis 25
Grobet's	dis 30
Reynolds Bros.' Hand Cut	dis 50
Industry File Works Hand Cut	dis 50

Hammers.

P. S. W	dis 40
Atha new list, Jan. 15, 1887	dis 50
Heavy hammers and sledges under 5 lbs	12c
" " " " over 5 lbs	10c

Jack Screws.

Illinois Bolt Co. list	dis 75

Nuts and Washers.

Size of bolt inches	¼	5-16	⅜	½	⅝	¾	1
Square	8	7	5½	4¼	4	3¾	3⅛
Hexagon	15½	11½	8½	6	5¾	5¼	
Washers	9	8	7	5	4½	4½	4½

In lots less than 100 lbs, ¼ lb add ½c., 1 lb boxes add 1c to list.

Nails (wire).

List July 14, 1887	dis 85
Standard Penny Nails, ¼ keg card rate	
Car lots	$2.15
Less than car lots	$2.35

Oilers.

Zinc and Tin	dis 60
Brass and Copper	dis 50
Malleable (Hammer's), No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ¼ doz	dis 10@10&10

Picks.

Railroads, 5 to 6 lbs	$12 dis 60
" 6 to 7 lbs	$13 dis 60

Pulleys.

Iron Pulleys, Walker List	dis 50
Medart Pulleys	dis 50
Split Wood Pulleys	dis 55@60

Pulley Blocks.

Moore's Anti-Friction Differential Chain Pulley Block	dis 20

Rivets.

Iron, Thousand, list November 1, 1894	dis 60@65
Iron, Ordinary, Cooper's Block and Carriage list November 1, 1894	dis 60@65
Copper	dis 50@50&10

Taps.

Cards, Hand and Nut to 2 in	dis 50
Carpenters' " " "	dis 50
Morse " " "	dis 50
Pratt & Whitney " " new list	dis 10
Machine Screw Taps	dis 55
Pipe Taps to 2½ in	dis 70
Stay Bolt Taps	dis 25
Stove Bolt Taps	dis 55
Pulley Taps	dis 40

Vises.

Solid Box	dis 60
Parker's	dis 20@25
Prentiss	dis 20
Stephen's	dis 25@30
Barrett's	dis 30
Miller's Falls	dis 40
Merrill's	dis 15@20
Howard	dis 35

Wire.

New List, Apr. 9, 1894

Brass	dis 40
Copper	dis 40
Bright and annealed, Nos. 0@18	dis 70&10@75
" " Nos. 19@26	dis 75@75& 5
" " Nos. 27@36	dis 75&10& 5
Coppered Nos. 0 to 18, market list	dis 70@70& 5
Galvanized Nos. 0 to 18 " "	dis65& 5
Tinned market Nos. 0 to 18	dis 67½
Cast steel	dis 50
Tinned Broom Wire	dis 70&5@70&10
Annealed Fence, Nos. 8 and 9	dis 75
Annealed Grape, Nos. 10 to 14	dis 75
Stub's Steel Wire regular	95c ¼ lb dis 30

Wrenches.

Coe's genuine	dis 50
Girard Standard	dis 70&10
Agricultural	dis 75&10
Mechanic's	dis 55&10& 5
Bemis & Call's Combination	dis 35
Donohue's Engineers	dis 20&10
Lamson & Sessions Engineers	dis 60
Billings & Spencer's Drop Forged	dis 25
William's " "	dis 25
Alligator " "	dis 40

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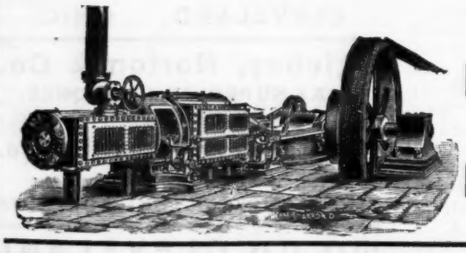

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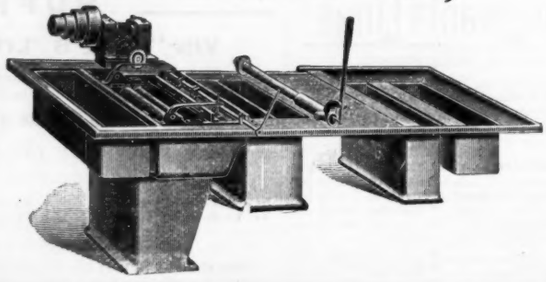

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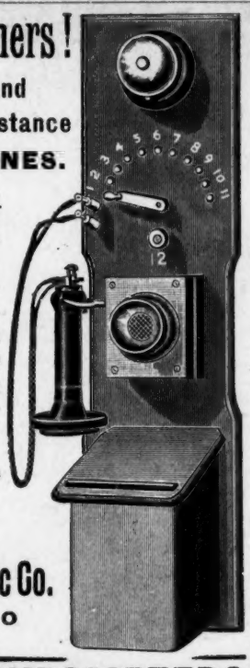

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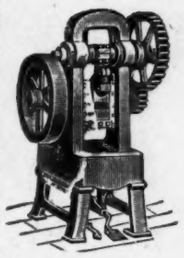

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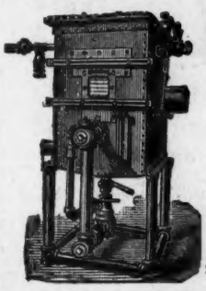

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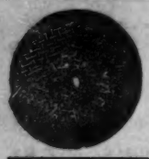

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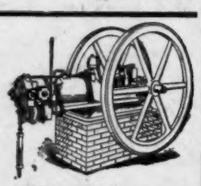

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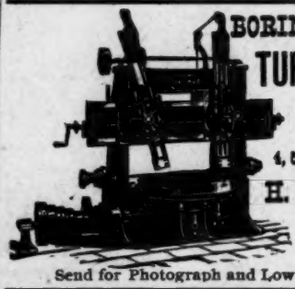

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